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THE WALKER MEMORIAL BUST

There are in existence two bronze busts of General Walker, one in the main hall of the Rogers Building near the president's office, the other in the Common Room of the Technology Club.

The first, an enduring evidence of the affection of his last four classes, keeps him always before the undergraduates; the second presents him continually to the great body of men of the preceding years.

The memorial in the Rogers Building was unveiled January 5, 1898, after brief exercises in Huntington Hall attended by the undergraduates and invited guests. President Crafts, who presided, first introduced Charles-Edward Amory Winslow, '98, chairman of the student committee. Mr. Winslow said:

"On the 5th of January, 1897, one year ago to-day, President Walker died. On the 7th of January a mass-meeting of the students was held in this hall to adopt resolutions expressing the grief of the undergraduate body. At this meeting it was voted that a committee of three make arrangements for a student memorial to the late president; Mr. Bancroft, '97, chairman of the meeting, appointed Mr. Hurd, '97, Mr. Washburn, '97, and myself to serve on this committee.

"The committee decided to secure the erection of a bust as the most fitting memorial within their power; and, for

its execution, turned to Mr. Daniel Chester French as an eminent sculptor and as a personal friend of General Walker. The committee wish to express their special gratitude to Mr. French for what has been, in a large measure, a labor of love. Unfortunately he is not here to-day so that we can thank him in person for the generous care which he has given to this matter; but he may be assured that the members of the Institute will not forget it.

"The funds for the monument the committee wished to obtain entirely from the undergraduate body; this was done before the end of the term, the sum being completed by a generous gift from the Class of '97.

"During the summer the bust was modelled; the autumn has been taken up in casting it and in constructing the tablet and the bracket upon which it rests. The completed monument now stands in the corridor below; and the committee are prepared to-day, in the name of the students of the Massachusetts Institute of Technology in the Classes of 1897, 1898, 1899, and 1900, to present it to the Corporation of the Institute.

"This bust is not needed, sir, as a monument to President Walker. President Walker's monument is found in something more enduring than marble or than bronze, in the great school which he built up until it led the world. President Walker's monument is found in something more beautiful than any creation of the sculptor's art, in the strong and noble characters which have drawn their inspiration from him, and moulded themselves after his example. The students of the Institute can erect a true memorial only by living after the manner of him who held that the mission of education was to make men, and by exhibiting increasing loyalty to the school which he believed was better equipped than any other to fulfil that mission.

"It is, then, chiefly to satisfy the need we feel to express our own emotions, Mr. President, that we have erected this memorial. We want to say, in some fashion which shall last as long as this building stands, that we were not quite unworthy of the great man with whom it was our fortune to come in contact here; that we repaid the friendship which he gave to every one of us with an admiration, a devotion, which is too deep for words.

"And we ask you to let this bust of President Walker stand in the corridor, Mr. President, because we want the students of the future to know something of his presence as we knew it. General Walker, while he lived, was not content to be merely a great name to his pupils; he must not become so now. His personality, which knit every Institute man to itself with special individual bonds, must never fade from memory.

"As you look upon the enduring bronze below, transfigured by the touch of a compelling art, you will feel that this personality is with us once again. You will see in that eloquent face the courage which was undaunted by the rout of Chancellorsville; the energy which revolutionized the United States Census; the broad, clear vision which established an epoch in Political Economy; the loyalty and devotion which built up this institution; the modesty, the hopefulness, the enthusiasm, which made President Walker our ideal of all that we hold true and manly.

"And as we see his firm, clear gaze looking into the future, we are assured that his spirit is with us at Technology; and that the Institute which he so loved will go on advancing in the path which he has set for it, glorying not in wealth and mere material prosperity, but chiefly in its unswerving loyalty to the great men and the great traditions of its past."

Professor Crafts, in accepting the gift for the Institute, said :

"It is rare that the monument which is to recall forever the living features of a great man is so soon set upon its pedestal. You have been told that the idea of such a memorial arose spontaneously with the first public expression of sorrow at a meeting held by the students two days after General Walker's death.

"There was no need to seek far for a sculptor ; a very distinguished one was among the wide circle of warm personal friends of General Walker. He willingly undertook the task, and has completed it so soon that it can be unveiled on this anniversary. We all join in the regret that he cannot himself lift the veil.

"In a few moments, when the bust is unveiled by a loving hand, we shall see the features of our friend and leader, and it is a satisfaction to feel that whoever looks upon them in after years can read in the bronze image something of the life he led among us. It is a good fortune for an honest man to have a face expressive of character, a face and bearing that make friends before a word is spoken, a sufficient presentation to any society, a passport to the good-will of all. The likeness of General Walker will tell to all beholders in the years to come that here was a frank and faithful man, social and courageous, earnest in whatever he undertook to do, and capable of doing much.

"I do not know how far those historians are right who, like Michelet, have sometimes undertaken to correct or set aside the judgments which their predecessors had founded upon old documents, bringing in their place an estimate of character taken from the lineaments of a newly discovered portrait ; but I am inclined to put some faith in the process, when I see how well nature has stamped the seal of

her nobility upon the face we have all looked upon with affection and trust.

"The inscription upon the tablet, 'Soldier, Economist, Statistician,' tells us the paths of life over which he walked, but only the bust below can tell us how the soldier squared his shoulders to his task, and strode straight onward in the path of duty, how his eye lit up with enthusiasm that made men follow him, how the scholar read mankind as his open book.

"If we ask ourselves with all seriousness the question of the poet, —

"Can storied urn or animated bust
Back to its mansion call the fleeting breath?
Can honor's voice provoke the silent dust?"

let us cherish the belief which we find in our hearts, that honor's voice may evoke the spirit, though it cannot provoke the silent dust; and the spirit present this day would surely find no offering more suitable than the one so well spoken in your names by the representative of the students, the dedication of your young lives to the straightforward, manly work which your leader loved so well, and tried to make you love as the best education. This is the last and the most enduring of the tributes paid to him who was our president from 1881 to 1897, erected, as the inscription says, by 'the last body of undergraduates of his great presidency, the classes of 1897, 1898, 1899, and 1900.'

"Gentlemen, in the name of the government of the Institute, I thank you for the gift. Your affection and ours will unite in making it a sacred memorial, and a token to all the classes yet to come of our respect for the man who continued so well the work begun by President Rogers. The two men, whose effigies stand on either side of the hall, had the great qualities necessary to build

up a great school, and we shall ever look upon them with love and reverence."

The audience then passed to the corridor below, where the bronze rests upon its marble bracket. Here the flag, which had till then concealed the bust, was drawn by Mr. Ambrose Walker. During the ceremony the Glee Club sang with beautiful solemnity "Integer Vitæ."

A vote of the Technology Club, taken soon after President Walker's death, and carrying with it the appointment of a committee to take action, expressed the earnest desire of all the members for some memorial within the clubhouse of him who had been no less devoted to the lesser welfare of the Club than to the far greater interests of the Institute itself.

After long consideration this committee, consisting of the president of the Club, of H. P. Talbot, '85, and of E. S. Webster, '88, reached the conclusion that no more satisfactory memorial could be secured than a duplicate of the bust so generously secured for the Institute by the undergraduates. By the courtesy of these students and of the Corporation of the Institute, in permitting a copy of the bust, and by the generosity of the sculptor, who made it possible to secure a bronze replica, the memorial was purchased by a general subscription of the members, and was put in position, on a pedestal designed by E. B. Homer, '85, in the summer of 1898.

As an informal dedication of this replica, and as a slight acknowledgment of his courtesy and generosity, a dinner was given at the Club to Mr. French on February 20, 1899, by the Corporation and Faculty of the Institute, the chairman of the memorial committee presiding, and informal speeches being made by Mr. French, President

Crafts, President Drown of Lehigh University, Prof. Charles Eliot Norton, and Mr. C. Howard Walker.

Mr. French paid a tender tribute to "the scholar and soldier, the great man whom we are honoring to-night." President Crafts said, in part:

"Friendship with an artist is one of the most fortunate things that can happen to a man. The artist hands his face down to posterity as he really is. I frequently see the older students and those who were here in his time pausing before the bust to refresh their recollections of the man they loved, or looking at that face, and learning what character means; and I wish to thank Mr. French in the name of the students for preserving to us that noble face."

Mr. C. Howard Walker spoke of his strong affection for both the sculptor and the subject, Mr. French and General Walker. He spoke of the deep friendship that existed between two men who could walk five miles together without saying a word to each other, following with several incidents which had occurred in his presence illustrative of General Walker's character.

Prof. Charles Eliot Norton, of Harvard University, eulogized Mr. French's work as an artist. He spoke glowingly of the dignity and simplicity of Mr. French's statue of John Harvard at Cambridge, and then of the "admirable bust which recalls to us so strongly his admirable face." "The art of the sculptor seems to me never to show itself more nobly than in reproducing the likenesses of men whose likenesses should be preserved in such a way that they shall go down to future generations not exactly as they were seen by any one of that generation except the poet and the sculptor who with clearer insight see what a momentary expression does not fully reveal, — that charac-

ter which lies behind a countenance, and which is essentially the man."

President Drown, among other things, said: "I am very glad to be here to do honor to this great occasion, to the great president, and the great sculptor who has preserved to us and to future generations this face, in its power, its strength, its charm, and its intelligence; to do honor to the sculptor who has done so much for the Institute. I am glad to add my personal thanks to Mr. French. General Walker was not only abreast of the times, he was ahead of the times. His writings placed him in advance of the political economists of the day,—and did anybody ever write with that great combination of strength and clearness of General Walker! It was that incomparable lucidity which gave him his prominent place among the economists of the world. General Walker was a fighter, and aggressiveness is one of the elements of leadership. How he did love controversy with his friends, but he always observed the rules of the game, no unfair thrust at any time.

"As an educator I think we can call him uniformly sound, and what greater praise can be given an educator in these days than that? After one has read over the mass of literature of the day on the subject of education, he will realize that sanity is about the rarest thing that one can claim for them. He realized that students come to the Institute ready for college, and that a broad and general training is as essential as a strictly professional one. It is due to him that in the Institute courses the backbone of culture studies is put in first, and the technical studies are then put around it. We are a little too near him now to realize this fully, but we feel, as no others can who come after us, that his work was great and good, and that this greatness and goodness will abide."

APPLIED SCIENCE AND THE UNIVERSITY

Fortunately for the right progress of civilization, that part of education maintained by schools and colleges is a markedly conservative force. It acts as a balance-wheel to steady the social machinery when over urged by material expansion or shaken by political disturbances. To do this it must obstinately cling to outworn systems of teaching, directly resisting, at times, the growth of human thought.

Through the discovery and utilization of natural forces, always existent but only gradually revealed, comes material progress. These new discoveries and uses, by changing his habits and social relations, compel an unceasing readjustment of mankind; and from this continued change springs what we call civilization. So erratic, irregular, and often revolutionary is this action that society would risk destruction by its own progress were its evolution not steadied by some strongly conservative, backward-reaching force, a force such as exists in school and college education.

To perform, however, this important function, even schools and colleges must continually, though slowly, readjust themselves, often adopting temporary expedients and elaborate subterfuges rather than to surrender, at the call of new conditions, their outgrown forms and usages. Hence result those compromises in education which are the bane of both conservatives and radicals. Such, nevertheless, is the constitution of society that educational systems, like governments, apparently can never be rational, never a logical and economical means to a definite end. Rather must they be always makeshifts, clinging to the past, and yielding only with protests to those innovations

which will not be denied. "One of the greatest pains to human nature," says Bagehot,¹ "is the pain of a new idea." Remembering this, and conceding that social progress needs a steady force, it is easier to bear with patience the bungling ways in which the old, useless husks of teaching are reluctantly discarded.

The process of educational adjustment has been hardest in this nineteenth century: first, because no previous hundred years has seen such enormous gains in material well-being; secondly, because the numbers admitted to mental training have been immeasurably increased; and, thirdly, because the means of and the causes for development have multiplied by leaps and bounds. What difficult problems these changes have brought to the elementary and secondary schools this is not the place to consider. Here we are to deal with the higher education only, with the formal training and the more intangible influences of the college and the university.

It will be generally conceded that, whatever the proper ends of secondary teaching, the aim of the college and the university toward the minds of their students should be chiefly to discipline and leaven, not simply to inform. The range of human knowledge should therein be opened to young men, but in such a way and with so much of method as to create in them that desire for mental power, that habit of high thinking, that broad and always widening outlook upon life, which distinguish the really educated from the merely well-informed. In the words of Principal Caird,² "A university has for its function the cultivation of the scientific habit of mind,—the faculty of grasping the universal element in all human knowledge. . . . What lends

¹ *Physics and Politics*, V.

² *University Addresses*, 1898, p. 3.

distinctive significance to the name University is that it is an institution which teaches, or professes to teach, what is universal in all departments of knowledge, and each separate department in its relation to universal knowledge." The University of this definition includes the college; but for the present purpose the term will be used, more narrowly, with reference to those years of graduate study and of special research through which the bachelor becomes a doctor.

Not, broadly speaking, what the bachelor or doctor knows, but how he knows it and to what use he can put this knowledge measure his real education. Though he possess many tongues and philosophies and be yet intolerant, he is still uneducated; though his degree be *magna cum laude*, the praise of his generation will be proportioned—moral worth being assumed—to his breadth of thought and his hospitality to new ideas. "One of the benefits of a college education," declares Emerson,¹ "is to show the boy its little avail." The college degree, like the hall-mark upon silver, guarantees the genuineness, but not the perfection of finish or the usefulness of those that bear it. The living seal of a real education can be given only in a true college or university through the personal influence of genuine teachers upon men fitted by character and by earlier training to receive and nourish it. The degree, under such conditions, betokens, not the completion of a course of recitations, but thorough equipment for a notable career.

True colleges and universities, therefore, must give more than is literally implied in the studies prescribed for a degree, must demand more than is involved in attendance upon exercises and the passing of examinations. Were

¹ Culture.

this not so, there would be little to distinguish them from those of China, where instruction and examination have been seemingly perfected. It is difficult to define this quality given by the real college and university to those ripe to receive it: education has too general a meaning, culture a too narrow one. Perhaps *breadth* is the best term, comprehending in a single word Doctor Caird's "faculty of grasping the universal element in all human knowledge."

The breadth of the college, however, is far less ample than that of the real university. As has been said, the college, fortunately, is conservative, anchored to solid foundations of accepted truth. Its body of teaching, therefore, must be that generally recognized, its educational spirit must be tranquil, its point of view sober, its tendency rather historical than speculative. Receiving young men at an age when mental and physical vigor is great, but judgment weak, when romance, enthusiasm, aspiration, have not yet been curbed and chastened, the task of the college is chiefly to impart to them some measure of human experience, through history and economics; to convince them of the supremacy of law, through mathematics and the physical sciences; to broaden their mental and spiritual vision, through language, literature, and art. The college has, moreover, still two other duties: that of guiding the physical and moral development of its students — the first through proper gymnastics, the second through the character and ideals of its teachers — and that of helping the young man to *find himself*, that is, to determine so far as may be possible what inherited gifts and aptitudes are his.

This, and no broader, being the scope of the college, it is plain that its students must be held, though to an ever

lessening degree, in tutelage. Were this not so, if youths of college age — which in this generation means from eighteen to twenty-two — did not need training of the general character outlined, why would it be necessary to send them to college at all, except for the purely utilitarian end of gaining a certain amount of information? If, as none will deny, the boy of eighteen does need to learn through human experience, to be persuaded of the inviolability of law, to be cultured through acquaintance with the ripest fruits of civilization, who is the best judge of how these weighty matters shall be opened to him, — the college faculty, or himself? Such a question can receive but one answer. Choice the youth should have; but not the aimless grasping of a child with a heap of toys. Only as he gains that wisdom and power which it is the province of the college to develop, ought the choosing to be more fully his; and never should it lie absolutely with him.

The general trend of his studies, after he shall have been at college long enough to have gained and given some knowledge of his capacities, must, indeed, be established by the youth himself; but, having fixed his general direction, he is not then to be permitted to tack and veer, hither and yon, trying this and that subject as fancy or indolence may prompt; his course, a limited one at best, must be so far laid out for him, there must be such correlation in his lines of study, that in the short time of college residence he may be carried as far as possible out of irresponsible boyhood into well-balanced, broad-minded, cultivated manhood. There is no contradiction in saying that a student's course should be narrowed in order to make him broad; but the restricting of his work and the resultant broadening of his life should be controlled, not by him, ignorant, but by those who through years of study, experience, and

teaching have "grasped the universal element in all human knowledge."

The breadth which comes from the university is widely different, — not in kind, but in degree. The college is designed to bring youth up to the mental level of his age, the university should carry him above it; the college fulfils its purpose in conserving present civilization, the university should build toward a higher intellectual and moral life; the college leaves its graduate measurably familiar with, or able to familiarize himself with, the sum of human knowledge, the university should graduate men able to make immediate addition to that sum; the college should produce students, the university, scholars.

The spirit of the university, therefore, must be one of absolute freedom, yet of rigorous severity. Its students must not only be men, — such men as the genuine college breeds, — they must be treated like men and judged like men. Therein there should be neither ornament nor convention, neither excuses nor "conditions," but work of the most exact and exacting kind. The college must and may adapt itself to the average man; the university exists for the exceptional men. No flight of the imagination and no depth of research but the university should encourage and give scope to; but it must unflinchingly require imagination to be steadied by learning and sobered by hard work, it must demand that research set forth from established principles and follow rigorous methods to provable results. Whatever may have been its origin and however shamefully the word may have been abused, the time has come when, for the credit of scholarship and the sake of solid learning, a university should mean that place only in which are bred, through the highest scholarship and the

fullest means of research, the intellectual leaders of the world.

How far from such a standard are most of the universities of to-day it is useless to point out. How completely such a standard can ever be realized it is idle to discuss; but toward this perfection all universities should strive, and in the light of it all pretenders to that title should be judged. Every college, moreover, without in the least attempting to inflate itself, should have such an ideal before it, closely affiliating with a university that will take its picked students and transform some few of them into scholars. It is not essential that the college and the university be associated under the same charter. Two or three institutions, indeed, the United States should have wherein is offered the entire range of collegiate and university work; the rest of them, especially the colleges, may well be widely scattered. But no college should rank as such which does not "hitch its wagon to the star" of some real university; and no university but should live in closest relation with one or many colleges.

As to the professional schools, — those of law, of medicine, of the other learned vocations, — their place in the scheme of education would seem to be a middle one between the college and the university, belonging — all of them — to the latter; but, from their special and restricted nature, partaking more fully of the methods of the former.

Four classes of students, therefore, would be found in a complete university. The first and largest class, that which finishes the college course alone; the second, and next in size, made up of those who pursue the college work, specialized more and more in the direction of their vocation, and follow it by a course in a professional school;

thirdly, those who, aiming at no distinctive profession, supplement directly the work of the college with that of the university; and, finally, those who complete the full educational journey, equipping themselves in the highest possible degree for a life of professional research or of teaching.

In an attempt to provide for these four classes, let not the college puff itself into a seeming university either by assuming the name, or, what is worse, by admitting boys of college age, who need — as never so much in their lives — mental discipline and oversight, to the freedom and self-direction of university methods. And, on the other hand, let there be no needless waste of time, no intellectual dawdling, but always a forelooking into the work ahead. Let the college anticipate, in the highest measure consonant with broad studentship, the special work of the professional school, and let the technical subjects of that school be ennobled as far as possible by the spirit and opportunity of original research distinctive of the university. The number of years spanned by a college-university is a matter of small consequence. The period may be as elastic as the extraordinary quickness of one student and the plodding thoroughness of another may make necessary.

The classical university of to-day has grown out of those of the Renaissance by slow accretion. Elaborate as is the modern curriculum, not a link is missing by which to trace it back to the few subjects of that earlier learning which found inspiration in the philosophy and linguistics of Greece, the oratory and jurisprudence of Rome, the theology of the Church, and the disputations of scholasticism, — all of it subjective learning, centring in man himself as the ancient cosmogony centred in man's planet. This old body of thought found its authorization wholly in the custom of

states, in the dogma of scholars, in the fiat of revelation. Because man had decided it thus, because God had revealed it so, these were the sole bases for believing. Arbitrariness was its only rule, custom its only visible foundation. And so aristocratic has remained this ancient learning, so absolute the entail upon its estates, and so unbroken the descent of its possessors, that, despite the changed conditions of material and intellectual life, it retains to-day much of its earlier prestige. Like "My Lords and Bishops," who, politically almost superfluous, yet walk before the real determiners of Great Britain's policy; so the Humanities, with a pedigree centuries old, with fair estates of literature, with a great tenantry of students, demand precedence of the Sciences, those "mechanic" parvenues who humbly minister to universal comfort and meekly control the destinies of all mankind. It is devoutly to be hoped that a day of complete materialism, when the latter would inevitably supplant the former, may never come; but, for the good of civilization, the time must soon arrive when the new will have equal rank with the old in the world of education, when there will be no more prating of "learning for learning's sake," but only a universal desire to learn for the higher purpose of advancing civilization.

Because, in the very nature of things, this equal rank could not be given to science, in this century, by the older universities, there arose such independent colleges as the Massachusetts Institute of Technology. Science in its many forms and applications is not now absent from any of the elder institutions of learning; but it is not fundamental to them; it has merely been added on—in some cases quite superficially—in obedience to pressure. Their science-courses have not sprung from the original trunk of college learning; they have not even been grafted upon

that ancient stock ; rather have they been used as props, put in perforce to save the tree from being rent asunder. There are to be found, indeed, very distinguished schools of science in connection with universities ; but either they are really independent in everything except the legal sense, pursuing their rounded careers quite without regard to the colleges of arts, or they are subsidiary to those colleges, carrying out but partially the work of education, and ranking, therefore, as professional schools, with those of medicine and dentistry.

This last position, it may be contended, is the proper one for a college of technology. In the eyes of many it should be a simple school for the training of engineers, architects, chemists, and other " practical " men in the technical details of their professions. And this attitude would be justifiable were it a mere question of mechanic skill. Were the problem one simply of imparting professional secrets and peculiar knowledge, there is no reason why a boy from the secondary school should not be pushed through some sort of course corresponding to that of the so-called business college, and be sent thence to the office or the field for those finishing touches which only practical experience can give.

But this whole question is not one of technical skill ; it is one of education. The aim of the day, the need of the day, is to produce not simply engineers, but engineers who are also educated men. And the best means of accomplishing this aim, of filling this need, is to provide for young men having a bent toward scientific study a collegiate and, if they will, a university education. Such youths must not be content with mastering formulæ and acquiring information special to their vocations, — a thing which might readily be done in the office of a good practitioner, — they

must acquire, if they would honor their professions, that quality which the college and university alone can give, that "faculty of grasping the universal element in all human knowledge" which is best called breadth. It is by balanced judgment, by far-seeing adaptation of means, by the modest yet persisting faith of real knowledge, by personal power to inspire confidence, by the irresistible force of the man who can,—in short it is by breadth of real education, that the engineer carries through those enormous undertakings which amaze and benefit his fellow men. The minutest acquaintance with formulæ, the most surprising "knacks," will not enable this stupendous work to be done by one who has not also breadth.

This being granted, where most directly and fully shall the young man who purposes to be a leader in some profession of applied science acquire this breadth? In the halls of an elder college, which has its roots deep down in the Renaissance humanities, which is builded upon an unalterable plan of linguistics and dialectics, to which such newer subjects as are gathered under the wide term, science, are but external and, in a measure, alien? Shall he best prepare himself for a profession whose methods must be almost purely inductive, whose results must be obtained by investigating phenomena, in colleges founded upon systems of thought largely subjective and knowing no other phenomena than those endorsed by Aristotle? Will he most profitably serve his apprenticeship to the master whose watchword is the absoluteness of natural law, in institutions whose foundation-studies are of purely human origin? Such training would not harm him. A college course of any kind is broadening, even though the subjects taught and the methods of teaching have a connection only most remote with the chosen vocation of the person taught. But the

question here is how best to prepare the engineer, how most amply to broaden him for his intended career. With that in mind, it is clear that those colleges will most acceptably train young men for the professions of applied science which rest broadly upon inductive thought and methods and which prescribe from the beginning, as a chief source of education, the systematic and profound study of natural laws. It is a matter of small moment, though one not to be despised, that such a college presents subjects of immediate utility ; but it is of immense moment that, at its most impressionable and active age, the mind of these young men should be steeped in an atmosphere of research, that, since every man must be a specialist, it should thus early be habituated to that essential tool of all scientific achievement, the inductive method.

It is true — so liberal and comprehensive are the leading American colleges — that a young engineer or chemist could easily select and follow in any one of them a course of study ample in preparation for the professional school of science ; but the atmosphere essential to his best development would there be lacking. However earnest the student, however faithful the teachers, the spirit of the place, while not hostile, cannot be heartily sympathetic. The youth fails to receive, therefore, that immense and lasting impetus which is so vital to his future and which a college of some sort alone can give. That he should fail to receive this is not the fault of the classical colleges. They are designed to educate in a certain way to a well-defined end ; and nobly are most of those of the present day fulfilling that design. The trouble lies in the fact that by tradition, by habit, by that very conservatism which makes them priceless to the community, they are unequal to the task of meeting fully certain conditions which have arisen with the nineteenth

century. Startlingly as they have modified their curricula to keep pace with the progress of scientific discovery, there is still lacking in them that atmosphere of scientific method which the colleges of technology, unhampered by tradition, have received as a birthright and which is essential to the best education of an engineer.

Having maintained, then, that the young engineer or other student of science will be best trained in a college especially designed for him, a college resting, to speak broadly, upon objective rather than upon subjective study, it remains to show whether or not the new colleges arisen to meet this need are competent to their difficult and important office. In doing this, I hope to prove them not only, at least potentially, equal to this duty, but competent, as they slowly and legitimately grow, to provide the entire range of education of a college-university.

A college must be conservative, yet progressive; it must secure to its students breadth as well as information; it must convert irresponsible boys into well-poised men. To do this it must lead a lad gradually out of the complete supervision of the secondary school into the freedom of the university by paths of study that, while teaching him experience, impressing him with divine law, giving him culture, shall also conserve his physical and moral soundness and enable him to "find himself." For such a task as this has not the college of applied science unusual qualifications? What better field for conservative progression than in a course of technology, where the measurably exact knowledge of yesterday is being steadily supplanted by the more exact knowledge of to-day, where the methods based upon earlier discoveries are always in process of modification through newer researches? By the very character of scientific investigation, which must be thor-

ough, which must be honest, which must proceed from the student himself, the boy is led to an understanding of life, to a comprehension of and respect for law, to a self-knowledge, that of themselves would make a man of him. But, in addition, the "unity in variety" of such a college, the many professional courses emanating from a few fundamental sciences, permit of the gradual expansion of the student's mind, of his slow release from the supervision of the earlier work into the freedom of later researches, of an unfolding of himself, of a discovery of his weak and his strong points most broadening to him and most enlightening to his teachers and his friends. Such courses present the very ideal of conditions for the right application of the elective principle. And, by its nature, very much of what such a student does must be accomplished by laboratory methods, than which no better means has ever been devised, not only to develop self-reliance, but to bring student and teacher into close personal relations impossible in the lecture or recitation room. The physical effect, moreover, of laboratory work, of the strenuous and sustained endeavor inseparable from the pursuit of applied science, is, when properly supplemented by systematic exercise, most salutary. Finally, through all the work of the college of technology runs the incentive, by no means to be disregarded or disapproved, that what the student does is useful, that what he undertakes has results, that what he begins leads to a definite end. There is added, in short, to all his work that excellent butter to the bread of sustained labor, interest.

Granting all this, it may still be argued that a course in applied science fails to provide culture; that in this direction, if in no other, the classical college offers superior advantages. But in what way does culture differ from

breadth? Does the possession of primitive learning give, of itself, greater culture than that of modern? If so, then folk-lore is superior to history, child-study to philosophy. There was wisdom, there was vigor of thought, there was purity of form, there was perfection of art, in the old days; but, even supposing that the college student of the classics absorbed, as he certainly does not, all this, would he not gain as much, or more, by an equal poring over modern learning? What has the world lost of all this old culture in its progress of centuries? On the other hand, what has it not gained by the bitter schooling of these more than two thousand years? Truly, as Bacon says, "*These times are the ancient times, when the world is ancient;*" and to-day's wisdom, not that of Greece, is the ancient wisdom, the wisdom acquired by generation after generation handing on the sum of experience, grown always greater and approaching ever more close to that eternal wisdom which is divine. The man of culture, it is true, should possess the largest measure possible of antique learning; but his well is but shallow if it does not draw also from the immense reservoir of modern scholarship. Culture, again, connotes the philosophic temper; but what is that but "the faculty of grasping the universal element in all human knowledge?" And will that faculty not come as surely from the study of Darwin as from that of Aristotle; from the thorough search into a problem of biology as from a digging for Greek roots?

Not the topic, but the spirit of the teacher and the taught, lies at the root of culture; and be they many or be they few, be they ancient or be they modern, the one requirement is that college courses should result in breadth. The sole study of biology, as, equally, the undiluted study of Greek roots, would result in insufferable narrowness

and pedantry. Each must be modified by as many other human interests as possible, if we would produce that quality of mind and character called culture. But such a result will be just as fully and honorably reached by courses of applied science, relieved and broadened by history, economics, and modern languages, as by courses of philosophy, relieved by ancient history, rhetoric, and so-called classics. Intrinsically, therefore, the college of applied science is as potent for culture as the classical college.

That, however, the colleges of technology, in their few decades of existence, have yet reached their fullest development, none will maintain. They are attempting, at the present time, to fill the anomalous and well-nigh impossible rôle of giving an academic and professional education in the four-year period of the old college course. Since the immediate demand is for mere technical training, since that demand is greater than the supply, since the whole matter of applied science is so new that there is not yet a standard of technological culture, the performance in these colleges of the work of education must, perhaps for many years to come, be incomplete. But in acknowledging this incompleteness, in appreciating the fact that the work of seven years compressed into four cannot induce in graduates that breadth which should be the aim of higher education, let these colleges not agree that culture in the amplest meaning is not theirs to give when, by time, by public criticism, by repeated experimenting, they shall have learned how best to enrich and amplify their courses. Already are they adding to and broadening the work in modern languages, in economics, in history; already are they widening the bases of their technical instruction so that it may rest more fully upon pure science and philosophy; already, as more scholarly leisure and greater wealth come to them, are

they opening to their picked students the paths of higher research. And in time, as the greatness of their possibilities is perceived, as those large endowments needful for scientific research come to them, as the vast culture-power of modern learning dawns upon a conservative, classically educated public, the college of technology will grow into a complete college-university. Then will its earlier years be given to the development of boys into men through judicious courses of modern learning, its middle years be devoted more closely, though not exclusively, to professional training, its higher years be dedicated to research, most exact and thorough, into the stupendous problems of pure science.

These colleges of science, including the Massachusetts Institute of Technology, are now on trial before the world. Their years of obscurity, of neglect, of almost abject poverty, are over; the public freely acknowledge that their work was needed and has been well done. But they cannot now stand still; neither can they longer follow the indefinite path permitted to experimenters. They must plainly indicate their future course. That course must be either backward or forward; backward into the comparatively easy position of a mere professional school, training engineers and others in the technicalities of their vocations; or forward over the long and difficult road of development, by traversing which they will become true college-universities fitted to lead young men, by paths of broadest culture, up to and through the most difficult researches of the highest education.

JAMES PHINNEY MUNROE, '82.

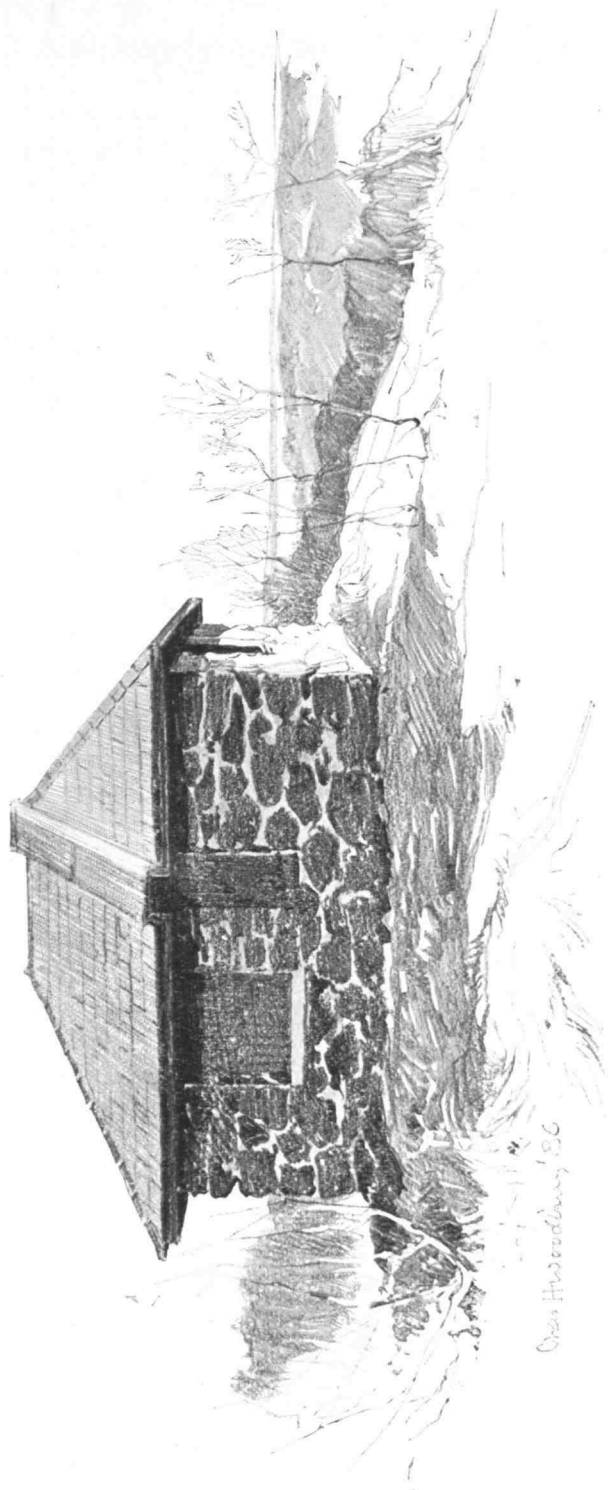
THE GEODETIC OBSERVATORY

A Geodetic observatory is a necessary part of the equipment of an institution giving instruction in geodetic methods of surveying. The plans for the erection of such an observatory near Boston have been under discussion ever since the adoption of what is known as the Geodetic Option of the course in Civil Engineering, but it was not until May of 1898 that the observatory became an established fact.

This observatory is intended primarily to be used in giving instruction in the most refined methods of determining latitude and longitude, and secondarily to be used in magnetic and gravity observations.

A hill in the southeastern part of Middlesex Fells was chosen for the site. Here was found a firm foundation for the most delicate instruments, free from the vibrations caused by railroad and highway traffic, and not too far from Boston. There is an unobstructed view of the heavens and the horizon, with the two United States Coast Geodetic Survey triangulation stations at Blue Hill in Milton, and Prospect Hill in Waltham, in plain sight.

The park commissioners kindly granted permission to the Institute for the erection of the building, with the provision that it should be built of field rock, and with pleasing proportions. The exterior was designed by Professor Homer. The building is of stone; it is fifteen feet square, and contains the following apparatus, namely: a transit instrument of two and one-half inches aperture, twenty-seven inches focus, with a delicate level and micrometer eye-piece for latitude observations; a sidereal chronometer;



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a chronograph; a magnetometer; a dip circle; an altazimuth instrument, and various other smaller appliances, such as a heliotrope, a self-recording barometer, etc. During the present year it will be further equipped with a one-half second pendulum for determining the force of gravity.

Observations have been made during the past term for the determination of time, and on latitude by Talcott's method. Arrangements have been made for the determination of longitude by telegraph connection with the Cambridge observatory.

Much work has been done at the observatory that could not be performed before at any of the Institute buildings. This is especially true of the tests on delicate spirit levels, and the determinations of constants depending on such observations. The freedom of the observatory from vibrations permits of such work, while its distance from all magnetic disturbances renders it especially favorable for observations with the magnetometer and dip circle.

It has been attempted to give the students in geodesy such practice as will not only illustrate the theory, but enable them at the end of their work to make satisfactory observations of permanent value with all the various instruments mentioned. The observatory will also be used by all civil engineering students in connection with their fourth year astronomy.

The observatory, on account of its unique position, will be a valuable magnetic station, and its observations will probably be incorporated in the general magnetic work of the United States government.

The sketch of the observatory on the preceding page is by Charles H. Woodbury, '86.

INSTITUTE MEN IN THE SPANISH WAR.

The Massachusetts Institute of Technology was honorably represented in the late war. Some of her sons were already in the regular army, or belonged to existing militia organizations; many more enlisted at the outbreak of hostilities; and a still larger number held themselves constantly in readiness to answer the call of their country. The undergraduates offered themselves to the State as a Technology battalion in these resolutions :

“Whereas, in the present condition of war existing between this country and Spain, it is fitting that all individual judgment should be merged in the expression of common loyalty and patriotism, and the resolution, if need should arise, to participate in the defence and support of national honor ;

“Whereas, the students of this institution have enjoyed, partly through the direct aid of the State and Federal Government, advantages which particularly fit them for the national service in the ranks, or in some special branch of the service for which their training may have fitted them ;

“*Resolved*, That the students of the Massachusetts Institute of Technology are prepared to serve their country when needed, and stand ready to respond to any calls made upon them by State or Federal Government authorities.

“*Resolved*, That a copy of these resolutions be forwarded to the Governor of the State and to the President of the United States.”

Their proffered services, while heartily acknowledged by Governor Wolcott, were declined in favor of existing organizations.

The editors of THE TECHNOLOGY REVIEW have made every effort to obtain satisfactory statements of the military service of Institute men. The results are given below. Many letters of the greatest interest have been received, and extracts from a few are published in Class News; much has necessarily been omitted. The editors will highly

appreciate information regarding any men whose names may have failed to come to their attention.

UNITED STATES OFFICER IN CHARGE OF MILITARY INSTRUCTION
AT THE INSTITUTE.

JOHN BIGELOW, JR. At outbreak of war, captain of Tenth U. S. Cavalry; in Santiago campaign; severely wounded in charge on San Juan Hill; commissioned major for gallantry.

1868.

RUSSELL, ANDREW H. Major, inspector of ordnance, U. S. A.

1873.

RIPLY, HENRY L. April 1, 1876, enlisted in the Battalion of Engineers, U. S. Army; June 17, 1877, appointed corporal; June 28, 1879, commissioned 2d lieutenant, and assigned to the Twenty-fourth Infantry; November, 1884, commissioned 1st lieutenant; February 23, 1887, transferred to the Third Cavalry; in January, 1895, commissioned quartermaster of his regiment, and captain, August, 1895. Went to Cuba in command of his troop, with Wheeler's division, Shafter's Fifth Army Corps; was in the fight of San Juan Hill on July 1 and 2; also present and took part in the bombardment of Santiago, July 10 and 11, and present at the surrender, July 16; Montauk Point, August 14 to September 23; September 23, returned to Fort Ethan Allen, Vt.; January 30, 1899, the President sent to the Senate his nomination as major by brevet, for gallantry in action at Santiago de Cuba.

1874.

BOUVÉ, WALTER L. At outbreak of the war, entered the service of the Commonwealth as 1st lieutenant First Corps Cadets at Nahant, on coast defence. In June placed in command of

a detachment at Hull, being stationed at the old fort on Telegraph Hill. May 13, 1898, commissioned assistant adjutant-general of volunteers with the rank of captain, to rank from May 9; June 18, assigned as assistant adjutant-general to the Third Brigade, Third Division, First Army Corps, commanded by Brigadier-General Andrews, colonel Twelfth U. S. Infantry, stationed at Camp George H. Thomas, Chickamauga, Ga.; September 1, stationed at Camp Hamilton, Lexington, Ky., and September 24, 1898, honorably discharged.

1876.

HUNT, ALFRED E. Had been captain of Light Battery B, National Guard of Pennsylvania, for fifteen years; April 25, 1898, date of declaration of war, every member of battery answered "Yes" to President's call; commission dated May 5, appointed him senior captain of light artillery in the United States Artillery service; May 15, Camp Thomas, Chickamauga, till July 15, then to Newport News and Porto Rico; in service in Porto Rico till end of war. When peace protocol was announced, battery was on point of firing on the Spanish works; mustered out November 17, 1898.

1881.

SWEET, HENRY N. At breaking out of war, ordnance officer, Mass. Naval Brigade, ranking as lieutenant, and in command of torpedo division; appointed by Governor Wolcott ordnance member of Board of Ordnance and Fortifications; manager American Ordnance Co. engaged in making rapid-fire guns and ammunition, the output of whose shops he quadrupled to meet demands of the Navy and War Departments; inventor of the double-action fuse for shrapnel used by the navy throughout the war.

1884.

BORUP, HENRY D. Lieutenant, U. S. A.

LYLE, DAVID A. Major, inspector of ordnance, U. S. A.

1885.

HAINES, JOHN T. At outbreak of war, 1st lieutenant and quartermaster Fifth Cavalry, U. S. Army, stationed at Fort Sam Houston, Texas; served in Porto Rico.

MACRAE, DONALD. May 13, 1898, captain Company K, Second Regiment, North Carolina Volunteer Infantry; in camp at Raleigh, N. C., until August 1; then St. Simon's Island, Brunswick, Ga.; mustered out November 18.

WESTON, JOHN F. Brigadier-general, U. S. A.

1886.

PIERCE, EDWARD L. Enlisted as second class private, July 2, 1898, in Company F, First U. S. Volunteer Engineers; mustered in as sergeant July 4; appointed 1st sergeant July 24; October 21, commissioned by the President 2d lieutenant, assigned to Company D; regiment left Peekskill, August 6, for Porto Rico, and reached New York on its return November 24; did considerable engineering work in Porto Rico; mustered out January 25, 1899, as 1st lieutenant and quartermaster Third Battalion.

PIERCE, JOSIAH, JR. June 13, 1898, commissioned major and engineer officer U. S. Volunteers, first service as chief engineer First Division, Second Army Corps; in July assigned to staff of Brigadier-General Grant; arrived in Porto Rico just after declaration of armistice; has served in Porto Rico since as head of public works and assistant secretary of the interior, and is now president of military commission trying criminal cases.

VIELÉ, MAURICE A. Captain, First U. S. Volunteer Engineers.

1887.

COOLEY, MAURICE W. June 28, 1898, captain Company B, Second Regiment, U. S. Volunteer Engineers; had three months' service in Cuba; resigned commission February 10, 1899.

SEARS, HENRY D. Lieutenant, Company E, Mass. Naval

Brigade, assisted in bringing U. S. Monitor *Catskill* Philadelphia to Gloucester, April, 1898.

WHITNEY, GRANGER. At outbreak of war member of Michigan Naval Brigade; April 29, 1898, proceeded to Norfolk and was mustered into U. S. Navy on U. S. S. *Franklin*; transferred to U. S. S. *Rosemita*; acted as convoy to various transports in landing party at Guantanamo; then relieved *St. Paul* in blockading port of San Juan; was in engagement at this port; continued on blockade until July 17; mustered out August 22, 1898.

1888.

COLLINS, BERTRAND R. T. At outbreak of war, ensign in the Illinois Naval Force; May 24, 1898, commissioned as ensign U. S. Navy, after competitive examination; June 2, ordered for duty on board U. S. S. *Scorpion* as watch and division officer; took part in third bombardment of Santiago fortifications, and in the engagement at Manzanillo; October 22, 1898, honorably discharged.

HOLTON, EDWARD C. At outbreak of war a member of Troop A, Ohio National Guard; May 9, 1898, mustered into service of United States; May 14, moved to Chickamauga; July 13, to Lakeland, Fla.; August 20, to Huntsville, Ala., leaving one hundred men (hospital corps and patients) in Lakeland; September 13, regiment disbanded.

MOORE, GEORGE D. First lieutenant, Twenty-third U. S. Infantry.

1889.

BORDEN, CHARLES N. At outbreak of war, a member of Massachusetts Naval Brigade; March 9, 1898, commissioned ensign in U. S. Navy on duty with U. S. Coast Signal Service; August 10, watch and division officer on the U. S. S. *Minnesota*; August 15, executive officer and watch officer on U. S. Monitor *Lehigh*; September 16, 1898, honorably discharged.

1890.

BROWN, EDWARD DEXTER. At outbreak of war, member of Troop C, U. S. Cavalry Volunteers; May 2, 1898, appointed corporal and went to Camp Black; May 23, Camp Alger, Va.; July 16, 1898, died at Fort Myer of typhoid fever.¹

FLOOD, SAMUEL D. After outbreak of war served as recruiting officer in Chicago; June 7, 1898, commissioned as ensign on U. S. S. *Yankton*; took part in the landing of marines at Guantanamo, the Santiago blockade, engagement with *Alfonso XII.*, and Cienfuegos blockade.

1891.

FÜGER, FREDERICK W. 1st Lieutenant, 13th U. S. Infantry.

HAMMOND, CHARLES F. May 19, 1898, chief master-at-arms, U. S. S. *Rosemite*; August 22, 1898, honorably discharged.

1892.

DU BOIS, BARRON P. Past assistant paymaster, U. S. S. *Bennington*.

FELAND, LOGAN. Captain, Company K, Third Regiment, Kentucky Volunteers.

MESSENGER, W. H. Assistant engineer, rank of ensign, on U. S. S. *Cincinnati*.

1893.

BAKER, FREDERIC W. Assistant Engineer on coast defence U. S. S. *Monterey*, now with Admiral Dewey at Manila.

BUCKLEY, JAMES P. Served as seaman on U. S. S. *Rosemite*.

HOWE, J. WILDER. June 25, 1898, commissioned 2d lieutenant Company H, Second Regiment, U. S. Volunteer Engineers; July 19, reported at Fort Sheridan, Ill.; August 12, proceeded to Middletown, Pa., and laid out camp for the Second Army Corps; October 30, proceeded to Augusta, Ga., to prepare camp for rest of corps; resigned in December.

1894.

FERGUSON, JOHN N. Member Massachusetts Naval Brigade,

¹ Memorial notice on page 108 of No. 1, TECHNOLOGY REVIEW.

assisted in bringing U. S. Monitor *Catskill* Philadelphia to Gloucester in April, 1898.

JONES, JOHN W. Private, Fifth Massachusetts Volunteer Infantry.

MACCLURE, COLBERT A. June, 1898, 2d lieutenant, Company D, Seventeenth Regiment, National Guard of Pennsylvania.

1895.

AMES, AZEL, JR. Upon passage of Act of Congress, authorizing recruitment of a Volunteer Brigade of Engineers, enrolled 116 men for it, and, June 8, 1898, received commission as captain in the First Regiment, U. S. Volunteer Engineers; June 17, reported for duty as recruiting officer at Boston, Mass.; June 27, ordered to Bangor, Me., to recruit river drivers, axe-men, etc.; July 14, Camp Townsend; August 10, left for Porto Rico; served in district of Ponce on various duty, including repairs and reconstruction of bridges; arrived in New York, November 25; January 25, 1899, honorably discharged.

COBURN, ARTHUR S. May 16, 1898, enlisted in U. S. Navy, as machinist; detailed to U. S. S. *Southery*.

FOSTER, SUMNER H. Captain, U. S. Volunteers.

KOTZSCHMAR, HERMANN, JR. At outbreak of war, senior assistant engineer on the U. S. S. *Manning*, in the U. S. Revenue Cutter Service. March 27, 1898, ship placed under Navy Department, proceeded to Norfolk Navy Yard, and received armament; May 3, proceeded to Key West, and then as convoy to the *Gussie* expedition; on May 12 and 13 was in action against Spanish troops and batteries; then patrol duty on north coast of Cuba; June 14, part of fleet convoying Cuban army of invasion; July 3, in action off Santiago; October 12, proceeded to San Juan; December 10, 1898, returned to Boston. Remains in service.

PARKER, CHARLES H. Member Massachusetts Naval Brigade, assisted in bringing U. S. Monitor *Catskill* Philadelphia to Gloucester, in April, 1898.

SHERIDAN, HENRY H. K. Enlisted April 25, 1898, second sergeant in Troop C, First Ohio Cavalry; June, in Chickamauga;

July, Lakeland, Fla.; August, Huntsville, Ala.; mustered out October 23, 1898.

TILLINGHAST, CHARLES F. At outbreak of war, captain of Company A, First Rhode Island Regular Infantry. May 10, 1898, commissioned captain Company A, First Rhode Island U. S. Volunteer Infantry; May 26, went to Camp Alger, with fully equipped regiment; August 3 to August 23, sent to various camps; August 23 to November 13, at Camp Meade; November 3, sent to Camp Fornance, Columbia, S. C.; February 14, 1899, still in service at Camp Fornance.

1896.

AMES, BUTLER. At outbreak of war with Light Battery A; May, 1898, commissioned as 1st lieutenant of the battery; resigned to accept adjutancy of Sixth Massachusetts Regiment; August, 1898, appointed lieutenant-colonel.

BROWN, HARRY W. April 1, 1898, joined Volunteer Corps of Engineers; April 6, began work on mines and firing apparatus at Fort Independence; April 20, work on mines at Fort Warren; October 1, 1898, resigned.

CONANT, FRANCIS M. Private in One Hundred and Forty-second Separate Company, National Guard of New York.

DANA, LESLIE. At outbreak of war, member Battery A, First Missouri Volunteers; April 23, 1898, mustered into service; in camp at Jefferson Barracks and Chickamauga Park until July 26; during this time chief trumpeter for the First Corps; then to Newport News and Porto Rico; at Arryo was one of four men to handle steam launches of U. S. S. *Gloucester* while unloading; took part in demonstration against San Juan; battery about to fire when protocol was announced; mustered out November 22, 1898.

LONNGREN, JOHN E. April 26, 1898, enlisted with Company B, Third Illinois Volunteer Infantry, and sent to Camp Tanner, Springfield, Ill.; May 13, sent to Camp Thomas, Georgia. Sick with pneumonia at Camp Thomas. While in hospital, transferred to Engineering Corps with rank of 1st lieutenant; furloughed until Oct. 8; Oct. 22, 1898, honorably discharged.

MORRIS, CHARLES, JR. June, 1898, appointed assistant paymaster U. S. Navy, on board U. S. S. *Hist*; still in service.

SCOFIELD, DONALD C. Private in Company B, Tenth Ohio Volunteer Infantry; now sergeant in same company.

SMALLEY, FRANK N. Hospital corps, U. S. A., Manila.

SPAHR, ALBERT H. Private in U. S. Volunteer Army.

1897.

ATWOOD, THOMAS C. April, 1898, enlisted in Naval Brigade, M. V. M.; June 16, 1898, enlisted in U. S. Navy, grade of ordinary seaman; assigned to U. S. S. *Inca* as gunner's mate, second class acting master at arms and coxswain of the gig. The *Inca* was assigned to coast defence, and stationed off Boston Harbor; August 27, *Inca* put out of commission; September 5, 1898, honorably discharged.

BROWN, WARREN D. Corporal, Company A, First U. S. Volunteer Engineers.

DANIELL, JERE R. June 24, 1898, appointed assistant engineer, with rank of ensign in U. S. Navy; June 27, proceeded to League Island, Pa., for orders; July 20, detailed on U. S. S. *Manhattan*; September 19, 1898, honorably discharged.

HUBBARD, CHESTER D. July 1, 1898, enlisted in Fourteenth U. S. Signal Corps, appointed second class sergeant; August 1, appointed first class sergeant of Fifteenth Company of Pennsylvania; August 8, sent to Montauk Point for duty (superintendent of construction of electric light plant); October, to Huntsville; December 3, Havana, Cuba; Jan 1, 1899, to Pinar del Rio (reconstruction of telegraph lines of province); still in service.

KENT, WILLIAM A. May 15, mustered in sergeant, First U. S. Volunteer Engineers; transferred to Third U. S. Volunteer Engineers; June 29, appointed sergeant-major; September 12, appointed 2d lieutenant; still in service in Porto Rico.

LOOMIS, HENRY M. One Hundred and Forty-second Separate Company, National Guard of New York.

POPE, CHARLES H., JR. Private, U. S. Volunteer Army.

1898.

HOWARD, SHELDON L. June 22, 1898, enlisted, private, Company I, Fifth Massachusetts Volunteer Infantry; appointed sergeant, Company I, Fifth Massachusetts Volunteer Infantry, and mustered into service, July 2, 1898, at Camp Dalton, South Framingham, Mass.; appointed acting regimental quartermaster-sergeant, September, 1898, at Camp Meade, Penn.; commissioned 2d lieutenant, Fifth Massachusetts Volunteer Infantry, and assigned to Company C, September 25, 1898; November 18, 1898, Camp Wetherill, Greenville, S. C.; still in service.

LANSINGH, VAN RENSSELAER. July 21, 1898, enlisted, first class private, U. S. Volunteer Engineers, Second Regiment, Second Battalion, Company E; July 22, sent to Fort Sheridan, Ill.; August 18, to Montauk Point, engineering work; honorably discharged.

LONG, ZOURI H. Corporal, Company A, First U. S. Volunteer Engineers.

OSGOOD, HENRY D. Enlisted as private in Troop A, First U. S. Cavalry; December 22, 1898, honorably discharged at Fort Riley, Kans.

STRICKLAND, WILLIAM R. May 14, 1898, received commission as assistant engineer with rank of ensign, and ordered to Mare Island Navy Yard; July 9, assigned to U. S. S. *Bennington*; September 18, ordered to Honolulu; January 26, 1899, honorably discharged.

TAYLOR, EDWARD M. July 27, 1898, commissioned 2d lieutenant, Company F, First Regiment, U. S. Volunteer Engineers; November 1, 1st lieutenant; December 6, adjutant second battalion; January 21, 1899, ordered to Peekskill to open office of First Volunteer Engineers; January 25, 1899, honorably discharged.

1899.

ADAMS, HERBERT H. Engineering work at Fort Warren.

BURWELL, FRED. O. April 28, 1898, enlisted in U. S. Navy, on board U. S. S. *Prairie*.

HITCHCOCK, ALBERT. Member of Second Massachusetts Volunteer Infantry.

HUSE, ARTHUR W. Private, Volunteer Signal Corps.

PIERCE, REGINALD K. June 9, 1898, enlisted Troop A, New York Volunteer Cavalry, and went to Camp Alger; July 23, ordered to Porto Rico, troop served as body-guard to General Miles; November 28, 1898, honorably discharged.

ROBSON, EDWARD R. April 24, 1898, enrolled in Fifth Regiment, M. V. M.; July 1, mustered into U. S. service in Fifth Regiment, Massachusetts Infantry, U. S. Volunteers, at Camp Dalton, rank of corporal; September 10, 1898, honorably discharged.

SNELLING, HOWARD. June 23, 1898, enlisted in First Regiment, U. S. Volunteer Engineers, as second class private in Company C, promoted to rank of corporal; August 5, sent to Porto Rico, rebuilt bridges and fort; January 25, 1899, mustered out of service.

TAYLOR, BRAINERD. June 21, 1898, enlisted as private in Company A, Sixth Massachusetts, U. S. Volunteer Infantry, and proceeded to Camp Alger; two weeks later left for Cuba, and witnessed surrender of Santiago; went to Porto Rico, July 26, 1898; took part in battle of Guanica; January 21, 1899, mustered out of service.

TAYLOR, DENZIL H. Company A, Sixth Regiment, U. S. Volunteer Infantry.

1900.

BORDEN, RAYMOND D. At outbreak of war, member of Sixth Division Naval Brigade, M. V. M.; April 28, 1898, enlisted in U. S. Navy, on board U. S. S. *Prairie*; May 13, went on patrol duty; June 27, left for Key West and Havana; July 1, on blockading squadron; July 5, first engagement; present during Santiago and Porto Rico campaigns; August 22, left for Montauk Point; September 28, 1898, honorably discharged as quartermaster.

KENDALL, FREDERIC M. May 6, 1898, enlisted; appointed sergeant in Company E., Sixth Regiment of Massachusetts Infan-

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try, U. S. Volunteers; was acting sergeant-major; May 20, left Camp Dewey for Camp Alger; July 5, went to Charleston and then to Porto Rico via Cuba; at various camps in Porto Rico; arrived in Boston, Oct. 27; Jan. 21, 1899, mustered out of service.

MILLER, S. BERWICK. At outbreak of war, a member of the Massachusetts Naval Brigade; May 3, 1898, enlisted in U. S. Navy on U. S. S. *Prairie*; May 13, went on patrol duty; June 27, sailed for Key West and Havana; July 1, on blockading squadron; July 5, short engagement at Moriel; present during Santiago and Porto Rico campaigns; August 22, returned to Montauk Point; September 28, honorably discharged.

1901.

BALDWIN, THEODORE A., JR. May, 1898, joined the Tenth Regular Cavalry as volunteer aide, his father being in command; went to Lakeland, to Tampa, and then to Cuba as part of the Fifth Army Corps; wounded in battle of San Juan; September 5, appointed 2d lieutenant of infantry and assigned to Twenty-fourth U. S. Infantry, at Fort Douglas, Utah; remains in service.

PATCH, CLAUDE E. June 15, 1898, enlisted in Company H, Sixth Massachusetts Volunteer Infantry; June 18, proceeded to Camp Alger; July 5, left for Cuba via Charleston; saw end of Santiago campaign; July 21, to Porto Rico; landed at Guanica; appointed acting company bugler; skirmishes; sick with typhoid fever; November 22, returned to Fort Monroe; January 21, 1899, honorably discharged.

JOHN CUMMINGS

Treasurer of the Institute 1872-1889

John Cummings died in Woburn, his native town, December 21, 1898. His long life of eighty-six years was closely identified with the history of the town, but his broad sympathies, and abounding energy, beginning their work at home, gradually reached far beyond its limits in the powerful support of many a good cause.

That his scholastic training was brief mattered relatively little. The classical curriculum of his early years might indeed have brought him into stimulating contact with great teachers, but its subject matter could have fitted his robust, practical nature but imperfectly. His real education, the rational study of men and things, continued into old age, with ever broadening horizon.

With Mr. Cummings' strong taste for country life and practical affairs, it was perhaps not strange that even in late middle life he should fall under the influence of Agassiz and Rogers, as they opened to the educated public of the time new views of the world. It was, nevertheless, remarkable that he should find time amid many diverse responsibilities to gain considerable personal acquaintance with several lines of natural science. This acquired interest in scientific matters led him to become an active member of the Boston Society of Natural History. United with energetic public spirit, and a notably high appreciation of the future dependence of the industrial arts upon applied science, it rendered it inevitable that he should become warmly interested in the beginnings of the Institute of Technology.

Although not a charter member of the Corporation, he became a member in the year following the opening of the school, his name appearing as chairman of the Committee



John Commincy

on Manufactures. In 1872 he succeeded Mr. William Endicott, Jr., as treasurer of the Corporation. The financial position of the Institute was perilous, and the treasurer-ship a post of heavy responsibility. President Rogers' health had yielded to the strain of the years of foundation. The cost of building had proved, on account of rising prices, a disproportionate drain upon the slender assets; union with Harvard had been proposed as a measure of financial relief, and refused, indeed, but with faith and courage, rather than with reliance upon visible resources. The number of students had risen with encouraging rapidity to 348 in 1872-73, but there followed, during the period of acute financial depression, an almost uninterrupted decline,—a decline shared indeed by colleges generally throughout the country,—until six years later there were but 188. It is known but too well from more recent experience that accessions of students may prove anything but a relief to the Institute treasury, but a growing school has always a certain prestige and claim upon public support, when embarrassed by its excessive popularity. After provision has once been made for a definite number, however, a decided falling off, even if gradual, means discouragement, and perhaps disaster. The years of general financial distress following '73, not only weakening the constituency of the school, but imperilling its invested capital, must have tested the fibre of the stoutest hearts. It was no ordinary good fortune that the man to bear, with President Runkle, a great share of this long-continued strain was John Cummings. They realized that with better times the Institute would abundantly justify the high hopes of its founders. Under the leadership of their confident courage the faith of the school in its own future stood unshaken.

In 1873 ex-President Rogers was indeed able to write

of the Institute as "very prosperous," but within a year the Corporation was earnestly considering the question of reducing salaries or abolishing professorships, and painful difficulties of this kind hampered the work of instruction for a considerable time. Professor Rogers writes President Runkle, in 1877, acquiescing in such a reduction, if necessary, as a last resort, and expressing his hope, in view of a possibility of Mr. Cummings' resignation, that "we might still retain his experience and wise discretion" in the management of the finances of the Institute. President Runkle's final report (for 1877) states that "without immediate relief we must either discontinue some of the departments, or cut down the salaries, already too small, or, more probably, both." The following year President Runkle laid down the burden he had borne so long, under the greatest difficulties that have ever confronted the Institute, and President Rogers resumed it temporarily, with the condition that the Corporation raise additional funds to the amount of \$100,000. The attempt was but partially successful, and various further retrenchments were necessarily effected.

Not the least of Mr. Cummings' services to the Institute was his share in the selection of President Walker, whom he had known during their connection with the Centennial Exhibition. It was at first feared that General Walker could not be secured. Mr. Cummings took measures to satisfy himself on this point, and, as soon as he had done so, coöperated zealously in securing the election. To the end of President Walker's life, he had in Mr. Cummings a devoted friend, upon whose strength he confidently depended.

In 1879 the student tide turned, beginning that steady rise which reached its flood last year. Until 1882, however, the attendance of 1872-73 was not exceeded. From that time on, the previous distress of dwindling numbers was exchanged for the embarrassment of crowded

classes, and soon of lack of land. In 1883 the William Barton Rogers Memorial Subscription of two hundred and fifty thousand dollars was raised by the efforts of Mr. Endicott, and in the same year the present Walker Building was erected. Land for the workshops on Garrison Street was purchased, and in 1888 that occupied by the present Engineering Building. In 1889 the number of students reached 827, and still another large building was near completion.

About this time, Mr. Cummings, already an old man, was overtaken by heavy financial reverses, from which he could not recover. He had not indeed sown the seeds of liberal public spirit and private generosity for so many years, to be left now without willing aid in undeserved misfortune, but the blow was well-nigh crushing and was followed by greater and greater physical infirmity, until, after years of devoted care, his hardy vitality should reach its end.

In accepting his resignation of the treasurership it was voted by the Executive Committee that the president be "requested to write to Mr. Cummings a letter expressing the high appreciation felt by the Executive Committee of the services rendered for so many years."

The following votes were passed by the Corporation :

"*Resolved*, That, at the close of the long term during which the Hon. John Cummings has held the office of treasurer, it is fitting that the Corporation should record its deep sense of the disinterested nature and the high value of Mr. Cummings' services. During more than one critical period in the history of the Institute of Technology it is fairly a question whether the school could have been sustained and its existence perpetuated but for his devotion to its interests and his courageous acceptance of responsibility.

"*Resolved*, That, in recognition of the services of Mr. Cummings as treasurer of the Institute, from 1872 to 1889,

the Laboratory of Mining Engineering and Metallurgy shall hereafter be known as the John Cummings Laboratory."

Mr. Cummings retained his membership and active interest in the Executive Committee until the spring of 1897, although his attendance became necessarily infrequent. At the Corporation meeting of March 10, 1897, it was voted, in accepting his resignation from the Executive Committee, to place the following minute upon the records:

"Mr. Cummings became connected with the Institute in 1866, soon after its active operations began. He was its treasurer from 1872 to 1889, a member of the Committee on the School from 1875 to 1883, when upon the formation of the Executive Committee he took the place upon that board which he has since retained. His services in all these various positions have been of the greatest value, and his enthusiasm and interest untiring.

"The assistance which he gave to the Institute while treasurer by pledging his personal credit to supply it with the means of carrying on its work is well known to the few of his contemporaries who remain, but it is only right that the younger members of the Corporation should be told that, but for the aid thus given, it is difficult to see how the work of the Institute could have been continued.

"It is one of the misfortunes of age that we outlive the remembrance of our deeds, but it must always be a great satisfaction to look back and remember how much of the success of a great achievement has been due to our own disinterested efforts, and this satisfaction belongs to no man connected with the Institute more than to Mr. John Cummings."

Mr. Cummings' strength lay not in speech, but in will and in action. He was not fluent, not eloquent, but always direct, earnest, convincing. He was quick of apprehension, instant in conclusion, keen in judging men, steadfast in confidence once given. No brusqueness of speech could wholly

mask his innate kindness of heart. His very errors were those of the man so instinctively honest as to be unwilling even to consider the possibility of dishonesty in others. Of his public and official service the records remain; of his private generosity none can know the extent or the fruits.

A great college treasurer can rarely receive the appreciation he deserves. Great college presidents are much in the public view. They meet successive generations of young men at an age when a strong man's personality counts for most in moulding character. They lead and embody the collective enthusiasms of a company of older men of common profession and purpose. They are brought into stimulating relations with men of eminence all over the land.

The treasurer must be a man of responsibility and entire disinterestedness; a man sure to be sought for other duties, but bound to serve the college even when conflicting cares crowd upon his time and energy. If he meets students and teachers at all, it must often be only to disappoint them by showing the impossibility of providing what they greatly desire. He must not only decide grave questions of financial policy, but must too often join in the solicitation of funds. He must be prudent and yet must on occasions be ready to go far beyond the bounds of business conservatism.

The modern college president, to the extent that he is skilled in business matters, may relieve the treasurer of much of this. Thrice fortunate is the college that can count upon the devotion of a treasurer who will relieve the president so far as may justly be of financial anxiety, enabling him to concentrate all his energies on administration and leadership in education. To such treasurers, and not least to John Cummings, the Institute of Technology owes a debt which it cannot indeed repay, but of which it may well preserve grateful remembrance. HARRY W. TYLER, '84.

THE PRESENT STATUS OF ATHLETICS AT THE INSTITUTE

How many among the Alumni know of the condition of gymnastics and athletics at Technology to-day? How many of the students know what the Alumni are doing in this direction in their behalf? How many appreciate the real condition of the present gymnasium? It is safe to say that the percentage is small. This lack of information is due to existing conditions. The Alumni—most of them—care little or nothing for athletics; the same may be said of a majority of the students; and gymnastics, sports, and games have not been advertised, managed, or encouraged along proper lines.

Interest in athletics has progressed through a slow and frequently retarded growth. It has now reached the stage where systematic exercise, accepted by all as essential to the development of sound, healthy minds, is, nevertheless, far from being generally practised.

At the Institute of Technology, in the early eighties, there was a representative tug-of-war team that rivalled any in the field. The old gymnasium used to be packed to its doors with spectators eager to watch the "drop" and the "red string" as it moved slightly beyond the zero-reading at the anchor's command, "Heave." Those were prosperous days in athletics. At that time, too, exhibitions in club swinging were popular. But the character of the competitions changed with the changes of classes, and more recently baseball, hare and hounds, 'cross-country running, track athletics, football, and, in fact, almost every branch of athletics, have been tried, and in turn superseded. Not many years ago a most ignominious defeat in baseball was



George.	Stebbins.	Holliday, Manager.	Heckle
Oppenheim.	Laws.	Morse, Captain.	McDonald.
Chubb.	Collier.	Jouett. Locke (Coach).	Nesmith.
			Nolte.
			Danforth.
			Maxson.

suffered at the hands of a rival college. The score was 60-1, the largest on record in the history of baseball. And this because a few acted for the whole. The affair was badly managed and partook of professionalism, and never has baseball at Technology been attempted since. There have been years, of late, when the annual open scratch athletic meetings, once popular and so successful, have been held by the Athletic Club with few outsiders competing. This was due to mismanagement and lack of proper advertising. Other ventures on the part of the students have brought about similar financial embarrassments. Through the efforts of the conscientious ones a change was, fortunately, made, and in the past few years this has been avoided.

Athletics were never in a more prosperous condition than to-day. An advisory council on athletics has been formed; representative men from the student body, Alumni, and Corporation compose it, and the few wise rules embodied in its constitution are, and should be, appreciated by Alumni and students alike. This committee has restricted intercollegiate contests to football and track athletics; to a recreation in the fall, and to a pastime in the spring; one a money-maker, and the other usually run at a loss, but the two self-supporting: a very sensible arrangement. This body regulates general athletic interests, and exercises supervision over the management of all Technology athletic organizations. It assumes control of all funds connected in any way with athletics, and has final jurisdiction in all matters pertaining thereunto. The proceedings of this organization are heartily supported by the Alumni, and it is gratifying to note the confidence placed in the council by the students. The latter appreciate the valuable advice of such a representative body, and they have consulted it many times in regard to matters of importance pertaining

to the athletic welfare of the Institute. The business of conventions, formation of leagues, and matters affecting relations with other colleges, are decided by this body. Through its influence members of the Alumni are reached, and those who have drifted away from Technology affairs are enlisted as supporters of athletics. One of the Alumni most active and interested in this line has offered a cup, which will be presented to the Freshman scoring the most points in the track games this year; and, altogether, the result of this new plan is satisfactory in the extreme.

President Walker, in his famous address before the Phi Beta Kappa Society, in 1893, said:

“The college athletics of to-day do wonderfully light up the life of our people. The great recurring contests and the intermediate practice games and friendly competitions of the several teams give acute delight to a large and increasing constituency. This nation has long shown the painful need of more in the way of popular amusement, of more that shall call men in great throngs out into the open air, of more that shall arouse an interest in something besides money-getting or professional preferment. In these respects college athletics have made an important contribution within the past few years. The marvellous rapidity with which football has spread, and is still spreading throughout the Western and Southern States, shows how eagerly it is welcomed as a relief to the monotony of life.

“A stronger plea for college athletics is made when it is urged that they result in stimulating an interest in gymnastics, not only among those students who do not engage in competitive contests, but also throughout the general community. The effect of this may easily be exaggerated.

There is many a week-kneed collegian who crawls out to witness the great baseball or football game of the year, looks on with intense delight, cheers the victors, if of his own side, as loudly as his limited lung capacity will permit, and then, when all is over, crawls back again to his room without so much as a conscious impulse to improve his own bodily condition. Yet it is certain that the cause indicated has an influence, and an influence not inconsiderable, for good. Admiration for manly prowess and the contemplation of fine physical development cannot fail to secure a much wider cultivation of gymnastics than would take place without it.

“ But, again, it must be said that the favorite athletics of to-day are, in great measure, such as call for more than mere strength and swiftness. They demand, also, steadiness of nerve, quickness of apprehension, coolness, resourcefulness, self-knowledge, self-reliance. Further still, they often demand of the contestants the ability to work with others, power of combination, readiness to subordinate individual impulses, selfish desires, and even personal credit to a common end. These are all qualities useful in any profession; in some professions they are of highest value, and it cannot be gainsaid that it is the normal effect of certain kinds of athletic sports to develop these qualities among the contestants, as well as to afford impressive examples to the minds of the spectators. So genuine does this advantage appear to me that were I superintendent of the academy at West Point, I would encourage the game of football among the cadets as a military exercise of no mean importance. It is the opinion of most educated Englishmen that the cultivation of this sport in the public schools of that country has had not a little to do with the courage, address, and energy with which the graduates of

Rugby, Eton, and Harrow have made their way through dangers and over difficulties in all quarters of the globe.

“The last consideration which I would adduce to show that what is sacrificed in athletics is not all lost is that in the competitive contests of our colleges something akin to patriotism and public spirit is developed, with results, on the whole, of good. It is true that young men often carry their manifestations of zeal and devotion to their colleges too far. Yet, both as counteracting the selfish, individualistic tendencies of the age, and as an antidote to the *nil admirari* affectations of our older colleges, it is a good thing that the body of students should now and then be stirred to the very depths of their souls; that they should have something outside themselves to care for; that they should learn to love passionately, even if a little animosity toward rivals must mingle with their patriotic fervor; that they should at times palpitate with hope and fear and anxiety in the view of objects which can bring them personally neither gain nor loss.”

In hearty accord with this sound attitude toward athletics, many Alumni and the Advisory Council hope to see a dual league formed in football and track athletics. It certainly would be pleasing to attend a football game in Boston on Thanksgiving Day, and the track and field games in the month of May; but a permanent arrangement may not be hoped for until there is a better gymnasium. The students, furthermore, must maintain a high standard for several years to warrant such an arrangement with a rival college. The student body, too, must be educated, or must educate itself, to the fact that football and track athletics must go hand in hand, not only from a purely athletic, but also from a financial standpoint. In every other college, although the particular accounts with

each sport are kept separately, the profits made in one line of sport are not necessarily expended there, but go to make up the deficiency which may exist in other branches. For instance, the large sums made by Harvard and Yale at football are expended primarily in the development of the crew, and, secondarily, on track athletics and other sports which may not draw people enough to pay the necessary expenses of training, etc. At the Institute, unfortunately, there has been a certain animosity between members of the football association and the athletic association. This must cease. No such jealousy should exist there. In the interests of pure athletics, for the welfare of our Alma Mater and of both football and track athletics, nothing but the friendliest feelings should be maintained, and it should be the purpose to bring the standard of learning — whether it be in a particular course of study or in subsidiary interests, such as athletics — to the highest possible standpoint.

Further, there is presumably not a college of similar size in the country where so poor support is given by the Alumni, both financially and in moral encouragement, as at the Institute. One hundred dollars a year contributed by the Alumni, either directly or by attendance at the games of the football and athletic associations, would keep these two bodies entirely free from debt, since this amount is about the deficit each season.

The present gymnasium is on property that cannot be leased for a term of years, being held only temporarily; in fact, the contents of the gymnasium may be forced out at a moment's notice, and the building torn down. It is inadequate for present needs. In justice to the Corporation and the Faculty, it should be known that they have thus far acceded to all the requests of the Advisory Council. Of course, they deem it unwise to make expenditures for im-

proving the gymnasium building under present conditions. As a result there are many conveniences desired that would be installed in a new gymnasium. It should be conveniently located and readily accessible. The interior should be designed to suit the purposes for which it is used, and not to satisfy the conventions of the architect. Among other things it should have a balcony or other proper space for spectators. The new gymnasium, moreover, should be designed with a swimming tank, and with numerous and modern shower baths. It should be equipped with plenty of the simpler and more-used apparatus, but with less regard to the remaining paraphernalia which are supposed to be necessary to a modern gymnasium. Again, it should be laid out appropriately for exhibitions. These are a few of the requirements of a practical gymnasium, and a few of the needs of the present one.

It is toward this end that the new movement of the Alumni Association is aimed. With the early completion of this proposed Walker Memorial Gymnasium, the newly awakened efforts of the Alumni and of the students, evidenced in the Advisory Council and in many other ways, cannot fail to have valuable results in a more general and more steady interest in the important questions of gymnastics and athletics on the part of the entire Institute body.

BENJ. HURD, '96.

THE WALKER MEMORIAL GYMNASIUM¹

Mr. President and Gentlemen:—Year after year we have looked forward to the time when the Institute should have a better gymnasium,—not as a luxury for a few, but as an essential means of health for the great body of our students. I count it a privilege to say to the Alumni to-night that I believe the time has come for action.

Two short years ago President Walker met us here, and we little realized how nearly spent was the vitality that had endured so much—so much for ourselves, so much for many a great cause since '61. It is not for me to eulogize him. Eloquent words are still in our memory. The bronze bust in the Rogers Hall attests the devotion of his last four classes. The Alumni Association has withheld voice and action until now, rightly judging that for it words would not suffice, and that action to be adequate must be deliberate. There can surely be none to doubt our duty as Alumni. Is there a graduate of the seventeen hundred from '82 to '98 who does not owe to President Walker a share, not only of his technical education, but of things greater and better,—his ideals of manliness, of good citizenship, of all that belongs to character? Do we not, then, also owe it both to ourselves and to the Institute—so great a part of which he was—to give fitting embodiment to our gratitude; to make the name of Walker mean to all future students something of what it means to us?

I take it, gentlemen, that thus far my thesis needs no argument; that whatever question remains can relate only

¹ Report of a special committee at the annual meeting of the Alumni Association. The concluding votes were unanimously adopted. See page 203.

to form, and to ways and means. What shall be our Walker Memorial? Some months ago the Association of Class Secretaries—that incarnation of Alumni zeal—appointed a committee, of which I have the honor to be chairman, to consider this question, with the hope of eventual coöperation with this Association. The committee has been asked by your Executive Committee to report at this meeting.

A few years since it would have seemed idle for the Alumni even to consider a subscription for a gymnasium for so great a body of students in a section where land values are so high. Now, however, the Institute finds itself occupying a gymnasium on land owned by the Boston & Albany Railroad, with a tenure apparently more and more precarious as time passes and railroads change. Because of this uncertainty, no radical changes of equipment can be made. At any time the Institute is liable to find itself with no gymnasium, a situation on which I will not dwell. This present difficulty, liable to become at any time more acute, must be met, and it can be best met only by beginning early with plans for a new gymnasium. I do not doubt that if the wealth of our Alumni were proportionate to their enthusiasm, funds for a gymnasium would be forthcoming to-night. I am sure that by extending our efforts over a series of years a liberal sum may be obtained, and I venture to express a confident hope that such a gift will not be refused by the Corporation, which has land available on Garrison Street, even if some draft upon the Institute treasury proves ultimately necessary.

How much can we hope to do? A few figures will suffice. In 1885 the Association, numbering about three hundred and fifty members, undertook to raise a scholarship fund of \$5,000 in memory of President Rogers within

a period of five years. In nine years the fund reached \$10,000.

Now we have nineteen hundred graduates, more than five times as many as in 1885. Let us, then, undertake to secure \$25,000 in five years, and let us make it \$50,000. This should meet half the cost.

We desire to commemorate President Walker; the Institute needs a gymnasium; no memorial could be more fitting. Himself an athlete in a broad sense, mentally as well as physically, he never failed to emphasize the proper limitations, as well as the high value, of physical exercise. However far the academic student may sacrifice the cultivation of the mind to the development of bodily excellence, the Institute student, already devoted to his profession, must keep play in due subordination to work. Yet the Institute student, most of all, needs to keep his body always in vigorous health to sustain his mental activity at its best. Nor does this mean mere gymnastic routine. The man of active brain needs better exercise than an endless round of mechanical movements, which may well suffice for the athlete, whose only object is to enlarge and harden his muscles. He needs variety, new forms of mental and nervous activity, — running, rowing, swimming, games. Some of these the gymnasium will provide; for all it will be a centre and support. We must strive by it to educate something more than the body faculties, teaching courage and courtesy, energy and self-command. The competitive element of class and college rivalry is a stimulus to be restrained, but also to be utilized.

Such, I believe, was President Walker's conception of what a gymnasium should be to the Institute. By such a gymnasium he would have rejoiced to expand the Institute education. What, then, can be more fitting than for us to

attest our appreciation of his ideals by associating his name with the realization of this one, which shall lead to a new and rational development of athletic interests at the Institute, which shall not weaken, but strengthen it as "a place for men to work, and not for boys to play?"

Mr. President, your committee offers in conclusion these motions:

That the Executive Committee of the Alumni Association appoint a Walker Memorial Committee of nine members, which shall undertake by a subscription the collection of a Walker Memorial Gymnasium Fund, to be applied by future agreement with the Corporation of the Massachusetts Institute of Technology toward the cost of erecting and equipping a gymnasium, as soon as may, in the judgment of the Corporation, be practicable.

That the Walker Memorial Committee have authority to associate with itself, for the collection of funds, representatives of the several alumni classes and of the local associations.

That the committee have authority to arrange as it may deem best for the custody of the funds received, pending their ultimate appropriation by the Alumni Association.

That the committee report progress annually to the Association.

H. W. TYLER, '84.

Pursuant upon the action taken at the annual meeting of the Alumni Association, the following men have been appointed members of the Memorial Gymnasium Committee: Robert H. Richards, '68, Thomas Hibbard, '75, Harry W. Tyler, '84, Everett Morss, '85, William B. Thurber, '89, Edward Cunningham, '91, Albert F. Bemis, '93, Benjamin Hurd, '96.

The first meeting of the committee was held on the evening of Saturday, March 4th, and steps were taken to effect a strong, permanent organization in order that the work might be pushed

forward with vigor. As a result also of this first meeting, information is being systematically collected which will be of prime importance in determining how much money it will be necessary to raise and how to raise it. In order to settle these two points as soon as possible, a study is being made of the size and cost of various gymnasiums, and an expression of opinion has been requested of the Faculty and Corporation, as to the future policy of the Institute in regard to the functions of its gymnasium. It was also voted to hold a conference at the Technology Club on the evening of March 25th, for the discussion of the whole matter of gymnastics and athletics at the Institute in their relations with the work of the committee.

GENERAL INSTITUTE NEWS

CORPORATION NOTES

The 275th meeting of the Corporation was held December 14th.

The following appointments presented by the Executive Committee were confirmed: Arthur Alphonzo Blanchard, Assistant in Theoretical Chemistry; Captain John Bordman, Jr., Instructor in Military Science; Oscar Warren Pickering, Assistant in General Chemistry; Charles T. Wentworth, Instructor in History.

Mr. Francis Blake was elected a trustee of the Museum of Fine Arts.

The President and Treasurer presented their annual reports, which were accepted and ordered printed. Both reports are largely occupied with accounts of gratifying benefactions.

George A. Gardner, Esq., has generously given \$20,000 as a fund, the income from which is to be used in the payment of salaries,—a much needed provision. Ten thousand dollars has come from the late John Foster, and \$1,482.78 has been added to the large sum previously received from the estate of the late Mrs. Susan E. Dorr for the Rogers Physical Laboratory.

Besides these gifts to the Institute itself a Travelling Fellowship in the Architectural Department has been established by the will of Willard B. Perkins, M. I. T., '72. For this purpose the sum of \$6,000 has been given, the accumulated income from which is to be used every fourth year.

Forty thousand dollars has come from the estate of the late Mrs. Ann White Dickinson, the whole sum for scholarship purposes.

A friend has given \$500 to meet a special want, and \$200 has come from Mrs. William B. Rogers, to be used for periodicals.

It is expected that the Institute will receive \$340,000 from the estate of the late Edward Austin—the new national legacy tax absorbing not less than fifteen per cent. of the original \$400,000. This amount appears to be intended for scholarships and other similar uses, and will be highly appreciated, but the great desideratum for the immediate future is accessions to the unrestricted funds of the Institute. It is a fact not generally understood that the actual expense of instructing our students is on the average \$330 per year, while only \$200 is paid as tuition fees. The balance, \$130, including interest on permanent investments, land, buildings, machinery, etc., has to be met from government and private benefactions, past and present.

The report alludes to the fire which came so near being a very sad disaster and to the gallant work of the instructors, librarians, and students in saving the books and apparatus of the Institute.

All through the reports from the different departments of the Institute come notices of the introduction of advanced studies in consequence of increased entrance requirements, and the school is making continued progress toward a higher standard for its degree.

Another notable feature is the progress toward a greater subdivision of classes into small sections in laboratories and the constantly increasing value placed upon laboratory work. During the past four years this movement has led to the appointment of eighteen new instructors, while the total number of students has remained about the same. If any one figure can be taken as a measure of the efficiency of a well-conducted school, it is the ratio of the total number of students to the number of instructors in

actual service. In the case of the Institute of Technology, without counting lecturers, there is one instructor to every eight or nine students,—one of the very highest ratios in the United States.

The following memorial vote was passed :

“ Our friend and colleague, Frederick W. Lincoln, died September 13, 1898. He had served for seven years as Mayor of the city of Boston, and was an important member of several other organizations besides the Institute of Technology.

“ He was a charter member of this Institute, and his service began on April 10, 1861, the date of our charter, and lasted till his death, over thirty-seven years. Our records show that he served at various times on the following standing committees : The Society of Arts, the Museum of Industrial Arts, the School of Industrial Science, the Museum of Fine Arts, the Departments of Modern Languages, and of Literature and History, and on nearly all the special committees needed to conduct the current business of the Corporation.

“ He never regarded his duties as perfunctory, but was always present when possible, and ready to be called upon for any service. His judgment was sound, and he brought to bear upon all subjects his wide experience gained in dealing with men and public affairs. His friendly aid was never sought in vain, and we can truly say, “ Well done, good and faithful servant.” We wish to commemorate his many and valuable services to the Institute of Technology, and to hold him in affectionate remembrance ; and at the same time to transmit to those who may come after us, as members of this board, so worthy an example. Therefore,

“ *Resolved*, That this memorandum be entered upon our records, and a copy be sent to his family.”

The following memorial vote was also passed :

“ On October 12th of this year John Murray Forbes died at his house in Milton, at the age of eighty-five. He was for twenty-five years a member of the Finance Committee of our Institute, and gave largely to its funds. He was a very remarkable man. He did an immense deal for the good of Massachusetts and of the

whole country. Such pluck and energy, such mental and physical vigor, such quickness and shrewdness, such good judgment and freedom from precipitancy, such willingness and thoroughness in work, such indifference to the danger and annoyance of hunger and fatigue of mind and body, and such devotion to the accomplishment of any object at which he aimed, were perhaps never combined in any other man in this community. Besides these practical qualities he had a warm love of nature and of literature, and people the most distinguished for culture and good taste found him a charming companion and host.

“His circumstances were peculiar. He was born in France in 1813, but was brought to this country at a very early age. After finishing his school life at Round Hill he began his business life in 1828, at the age of fifteen, in the office of his uncles, the Perkins Brothers. In 1830, on the death of his older brother, who was a clerk in this firm’s office in China, he went to China to take a position as bookkeeper. He was now only about eighteen years old, and he returned to Boston when he was twenty. But already his conduct had gained him the confidence of business men, and he had become the agent of the very rich Chinese merchant, Houqua. In February, 1834, he married Miss Hathaway, a woman of rare character and charm, and he went to China as supercargo, expecting to return at once. He found awaiting him there a partnership in the house of Russell & Co., the successors of the Perkins Brothers, and it was offered in such a tempting way that he could not refuse it. In 1837 he gave up his partnership in Russell & Co., and returned to this country in the midst of the crisis. He was then the sole American representative of Russell & Co. in this country. And, moreover, he had charge of important shipments and of large amounts of money for the rich merchant, Houqua. He bore a peculiar and very influential relation to the house of Russell & Co., and built a great many of their ships.

“Mr. Forbes, at twenty-five years of age, with ten years of world-wide business experience, had formed an unfavorable opinion of railroads, owing to the results he knew of in England, and for eight years he confined his attention to building and sailing ships and to

China commerce. In 1846 the Michigan Central Railroad was not yet nearly finished to Chicago, and was in a wretched condition. Mr. Forbes and some of his old associates bought it, and he became president. In 1852, or thereabout, he gradually bought up various pieces of railroad between Chicago and the Missouri River, which in 1857 were consolidated into the Chicago, Burlington & Quincy Railroad. After 1859, and until his death, he was a director in the Chicago, Burlington & Quincy, sometimes president, and for a long time chairman of the board, and always the leading mind until perhaps 1890, or thereabout, when he gradually and slowly withdrew more and more from active participation.

"Thus his business life began simultaneously with the development of this country by the use of steam for transportation; and in view of his peculiar powers and characteristics, and his fortunate position as to wealth and training, it would be strange indeed if his life had not been full of exciting business experience.

"When the war broke out he threw his energy and power into the support of the country. One who was by his side in the troubles of those days tells me that it is impossible to say too much of his patriotism, and that there was nobody to whose judgment Governor Andrew deferred more than to Mr. Forbes's. He rendered constant aid both by advice and by his readiness to take pecuniary risk in the State's service, and he contributed greatly to the grand war record made by Massachusetts. He also aided the National Government greatly, going to Europe in 1863 to sell United States bonds and to stop the depredations of the *Alabama*.

"He was too much taken up with business, war, and political affairs to give our Institute much time or thought; but his gifts to it, amounting to \$35,000, began in 1867 and continued till 1894; and his relations to it and to Professor Rogers were such that Mrs. Rogers speaks of him as a devoted friend and benefactor of the Institute. Of the innumerable instances of his thoughtful and effective kindness to individuals it is needless to speak, and of course each person knows only a small part of them. He had no desire to have such acts displayed before the public.

The 276th meeting of the Corporation was held at the Institute March 8th.

Additional appointments on Visiting Committees were made as follows: Mr. Draper on the Department of Mechanical Engineering; Mr. Peabody on the Department of Architecture; Mr. Thomson on the Department of Physics and Electrical Engineering.

Mr. William Marshall Perley was awarded the degree of Bachelor of Science in the Department of Chemistry.

The following appointments, presented by the Executive Committee, were confirmed:

Francis Harold Dike, Instructor in Modern Languages.

Teachers and Lecturers for the current year: John Alden, S. B., on Textile Printing; Truman H. Bartlett, on Modelling; Louis Bell, Ph. D., on the Electrical Transmission and Utilization of Power; George W. Blodgett, S. B., on the Application of Electricity to Railway Signalling; John Balch Blood, S. B., on the Design of Alternating Current Machinery; Henry Carmichael, Ph. D., on Electrolysis of Brine; S. Everett Doane, on Incandescent Lamps; Howard C. Forbes, S. B., on Commercial Electrical Testing; John R. Freeman, S. B., on the Hydraulics of Fire Protection, and on Fire-proof Construction; Hollis French, S. B., on Electrical Engineering Practice and Specifications; David A. Gregg, on Pen and Ink Drawing; Hammond V. Hayes, Ph. D., on Telephone Engineering; Charles D. Jenkins, S. B., on Illuminating Gas, and on Pottery and Tiles; Ernest A. Le Sueur, S. B., on the Industrial Applications of Electro-Chemistry; Arthur D. Little, on Paper; James W. Loveland, S. B., on Manufacture of Soaps; Samuel W. Mead, on Architectural Design; Edward P. North, on City Streets and Pavements; Odin B. Roberts, S. B., A. M., LL. B., on the Nature and Function of Patents for Inventions; A. H. Sabin, M. S., on Paints and Painting; Albert Sauveur, S. B., on Metallography; Timothy W. Sprague, S. B., on Electricity in Mining; Frank G. Stantial, S. B., on Sulphuric Acid; John Stone Stone, on the Application of Electrical Oscillations in Telephony; Elihu Thomson, on Recent Developments in Applied Electricity; Ross Turner, on Water Color; W. Lyman

Underwood, on Industrial Biology; C. Howard Walker, on the History of Ornament; George C. Whipple, S. B., on the Microscopical Examination of Water-supplies; C. J. H. Woodbury, A. M., on Electricity in its Relation to Fire Risks.

On recommendation from the Faculty the following candidates were awarded the degree of Bachelor of Science: Albert William Tucker and Edward Saxon Wiard, in Mining Engineering and Metallurgy; and Timothy Joseph Driscoll and William Braman King, in Electrical Engineering.

Reports were presented by visiting committees as follows:

Mr. Clarke for the Committee on the Department of Civil Engineering; Mr. FitzGerald for the Committee on the Departments of Mechanical Engineering and Applied Mechanics; Mr. Peabody for the Committee on the Department of Architecture; Mr. Blake for the Committee on the Department of Physics and Electrical Engineering; Mr. Sewall for the Committee on the Department of Modern Languages; Mr. Stockton for the Committee on the Department of Mathematics.

Among matters of general interest which have been acted on by the Executive Committee the following may be noted:

Professor Barton has undertaken, with the approval of the Corporation, to conduct a Saturday class in Blowpipe Analysis for teachers. This is an outgrowth of the classes in geology, maintained by the Lowell Institute for a number of years.

Plans have been presented by Professor Homer, and approved by the Corporation, for a European summer school in architecture, similar to that so successfully carried out in the summer of 1896.

With the increased extent of the Institute buildings communication between different departments has become more and more difficult. There have been for some years local telephones, but it is now intended to organize a comprehensive service with several stations in each building.

To the great regret of the Corporation and Faculty, Professor van Daell's continued ill-health has compelled him to give up all work for the remainder of the year. The Executive Committee

having granted him a year's leave of absence, he sailed for Hamburg, March 11th, expecting to stay for a time in Wiesbaden and later farther south. The most cordial good wishes of the Corporation and Faculty attend him.

Announcement has been made to the Corporation of the donation to the Institute, by Professor Runkle, of his mathematical library. This accession is of great and timely value to the mathematical department. The current appropriation for the department has been so fully required for new publications and periodicals, that it has not been possible to do much in regard to the older standard works. Professor Runkle's donation strengthens us on this side, and includes also a large number of text-books and various works now out of print. The cordial thanks of the Corporation have been returned, and an appropriate tablet placed in the library.

It has been previously noted that the mathematical library has secured new quarters by reason of the erection of the Pierce Building. The new room, 20 Rogers, thanks to the energy and persistence of Professor Bartlett, has been admirably fitted up; the books, periodicals, and models are effectively arranged, and a more personal element added by the introduction of a number of portraits of eminent mathematicians. The library cannot fail not only to have greater usefulness for members of the department, but also to attract such of the graduates and older students as have time and inclination for mathematical pursuits.

Institute men will be greatly pleased to learn of the election of Mr. Desmond FitzGerald as president of the American Society of Civil Engineers at the annual meeting of the society, which was held in New York in January last. Mr. FitzGerald, though not an Institute graduate, is a member of the Corporation and an earnest friend of the school, and is always ready to aid Institute men with his advice and assistance. As an engineer, he is well known throughout this country and in Europe as well, and his election to this office is a well-deserved tribute to an eminent engineer as well as a broadly developed man. Mr. FitzGerald began his

engineering career in Providence. He was afterward employed on various railroads in the West and finally by the Boston and Albany Railroad. In 1873 he became engineer of the Western Division of the Boston Water Works, and from that time to the present he has maintained his connection with the Boston Water Department, having had charge of the western division of the works, which includes all the sources of supply and the large storage reservoirs in the Sudbury basin.

Mr. FitzGerald has shown in his engineering work that rarest of all qualities of the engineer, breadth of view. He has given particular attention to the quality of water supplies; he was the first engineer to establish a biological laboratory in connection with a water works system; and he has made important original investigations of his own in questions concerning meteorology, filtration, and other subjects connected with his professional work. He is also widely known as an expert and has been connected with many noted legal cases. He has twice won the Norman medal of the society of which he is president, the first time in 1887 for an elaborate paper on "Evaporation," and again in 1893 for a paper on "Rainfall, Flow of Streams, and Storage."

In addition to his engineering work, Mr. FitzGerald finds time to discharge other important public duties. He is chairman of the Topographical Survey Commission of Massachusetts, and in his own town of Brookline he is chairman of the Park Commission and trustee of the Public Library. He has also been president of the Boston Society of Civil Engineers and of the New England Water Works Association.

Finally, Mr. FitzGerald is actively interested in literature, music, and the fine arts. As an art critic in certain directions, he has few superiors in Boston, and he is himself an admirable artist with the crayon. Would that other engineers could realize the lesson which is to be learned from a study of his character and career, namely, that one of the best guarantees of success in engineering is to be a well-rounded, symmetrically developed man.

G. F. S.

FACULTY NOTES

The first catalogues for 1898-99 were received from the printer January 27th, in season for those students not fortunate enough to have finished their examinations. Unusual difficulty has been experienced in securing the addresses of the last hundred graduates, partly on account of the numerous changes resulting in one way or another from the Spanish War. It may be noted that 117 pages—more than one-third of the entire volume—are occupied by the register and alphabetical list of graduates.

The work of the first term ended with the usual semi-annual examinations January 28th, the new term opening February 7th. This term, for the first time, attendance cards have been printed by courses, obviating the necessity of reference to the key for the interpretation of numbers, and presenting in convenient form the entire schedule of second term work for each course, with the number of hours of exercise and preparation.

A few words in regard to the evolution of that highly organized product, the attendance card, may not be without interest. In the earlier years of the Institute each student wrote on a large sheet of paper his year, course, and option, noting deviations, if any, from the regular schedule. Few classes were so large as to require division into sections. Ten years ago the attendance paper had become a card, but was rather a small affair, with sixty odd subjects arranged by years, each followed by the numbers of those of the nine courses including it. This form of card corresponded rather closely to the present subject card, on which the number of titles of the present term is 255, almost a quadruple increase.

In 1891-92 the number of subjects had increased so much, and there were so many possibilities of error in using the card, that a new form was introduced, which has remained in use until the first term of the present year. A subject card was printed containing in alphabetical order by years the titles of all courses given, each followed by its number in the schedule of topics of the catalogue, and preceded by a number corresponding to its place in the alphabetical list. The attendance card proper consisted of a tabular

grouping by years and courses of the numbers of the various subjects on the subject card, which thus formed a key to the otherwise incomprehensible numerical schedule. In 1894 the subject card was further enriched by the insertion of the hours assigned by the Faculty for exercise and preparation in each subject. It was hoped that any complaints of overwork on the part of students would be met by thus placing in the hands of each one an authoritative statement of what could justly be required by each of his instructors; in the second place, that instructors would observe more carefully the due restriction upon their assignments. However this latter may have been, it would appear that the students have either not suffered any imposition, or have preferred to submit without question, as actual complaints have been exceedingly few.

This year, as mentioned above, the experiment has been tried of printing an independent attendance card for each of the thirteen courses. This makes it possible to have titles instead of merely numbers on the attendance card; and, in the second place, to have sections indicated on the same card, instead of independently. Moreover, it offers to instructors and students a term schedule of each of the courses, a matter of no little practical convenience. The attendance card forming as it does the basis of the entire routine administration of the secretary's office, comes into almost incessant use, so that its exact form is a matter of no little importance.

An invitation has been received from the University of Cambridge that the Institute be represented at the jubilee of Prof. George Gabriel Stokes, June 1st and 2d. Professor Stokes' long and distinguished career makes the occasion of extraordinary interest, and if the Institute cannot be represented by a member of the Faculty, a congratulatory message will be sent by the president.

A reception to superintendents and teachers, arranged by the committee on preparatory schools, was held at the Pierce Building on Saturday afternoon, February 14th. After an informal reception by members of the committee, a substantial lunch was served by Mrs. King. The company then assembled in Room 11, and listened to addresses by President Crafts and Professor

Chandler. President Crafts spoke of some of the relations between the secondary schools and the Institute; Professor Chandler of some points in the architecture of schoolhouses, illustrated by a number of lantern slides of recent work in Boston. The guests were then taken about the building until 4 P. M. The attendance was, on the whole, satisfactory, and much appreciative interest was manifested by our guests.

THE UNDERGRADUATES

FRATERNITIES AT TECHNOLOGY. — The absence of the college dormitory at Technology removes one very potent factor in the development of a healthy college spirit. The place of the dormitory is taken, however, to some extent by the chapter houses of the different fraternities at the Institute.

Sigma Chi was the first to establish, in 1882, a chapter at the Institute. Sigma Chi was followed at varying intervals by Delta Psi, Chi Phi, Delta Kappa Epsilon, Phi Beta Epsilon (local), Delta Epsilon, Sigma Alpha Epsilon, and Delta Tau Delta, in the order named, the last in 1894, since which time no new chapters have been established. Most of the fraternities possess chapter houses in the vicinity of Technology, and have an average membership of about twenty.

Other fraternities represented but having no chapters at the Institute are Alpha Delta Phi, Phi Gamma Delta, Beta Theta Psi, Psi Upsilon, Theta Delta Chi, Zeta Psi, Alpha Tau Omega, Kappa Alpha, Gamma Delta Psi, Phi Kappa Psi, and Sigma Phi.

The year 1885-86 showed eight and five-tenths per cent. to be fraternity men. The number gradually increased up to 1892-93, when there were two hundred and seven fraternity men, a percentage of eighteen and eight-tenths. Since then the number has gradually diminished, giving in 1897-98 fourteen and four-tenths per cent., or one hundred and seventy-three fraternity men.

THE CLASSES. — The Freshman Class has so far shown itself

quite capable of performing its part in the affairs of the Institute. Beginning with the cane rush, in which, although defeated, they made a spirited fight, and the class football game, in which they completely outclassed the Sophomores both in team work and individual dash, 1902 has taken a lively interest in all branches of athletics; in the runs, especially, their candidates are very promising. The class is well represented in the musical clubs and has two men on *The Tech* board.

The Sophomore Class has this year had a rather unfortunate series of political disturbances, beginning with the resignation of their president, R. B. Clark, who left the Institute to go into business. As we write, however, we are glad to state that an amicable settlement of the difficulties has been reached. Next to the presidency the election of a *Technique* Electoral Committee and the selection of a Board of Editors occupy the attention of 1901. Before the appearance of this number of THE REVIEW we trust that the offices of president and first vice-president will have been peacefully filled, and the election of a representative *Technique* Electoral Committee and choice of an able and harmonious Board of Editors will have been satisfactorily accomplished, so that 1901 may take its place as Junior Class with no embarrassments to hinder its progress during that important period of college life.

Just at present the Junior Class is looking forward to that brightest spot in our college year, Junior Week. The programme for this year includes the Junior "Prom," with a reception to "Prom" guests at the Technology Club on the afternoon preceding the dance, the Walker Club Theatricals, the spring concert and dance of the musical clubs, and a reception and tea by the Board of Editors of *The Tech*. During this week *Technique*, 1900, will make its appearance, and this event is always awaited with the greatest interest.

The Seniors are to be congratulated upon the recent adoption without the usual clash of rival factions of a system for the election of Class Day officers. The election will occur almost simultaneously with the issue of THE REVIEW. Class Day elections have too often been characterized by the display of much personal ill

will, or even enmity, thus marring what ought to be the pleasantest part of our college life; we are, however, happy to state that '99 bids fair to set an example which succeeding classes will do well to emulate.

DIE GESELLSCHAFT. — The plan of study as outlined in the last issue of *THE REVIEW* has been followed with considerable success by the members of *Die Gesellschaft*.

The history of German literature up to Lessing's time has been followed by the members of the society.

Prof. Frank Vogel has given the first of a series of delightful book talks, which, by virtue of the resources of the Boston Public Library, will play an important part in the work of the year.

A plan is under way for a series of talks upon the German Universities, to be given by their representatives now at the Institute.

THE WALKER CLUB was formed in December, 1894, by the students of Course IX. The Club meets, usually, about once a month, and an informal talk is given on such subjects as "Journalism" and the like. For the past three years the Club has presented an English play during Junior Week. In 1896 "Mr. Jones," by Harry D. Hunt, '97, and the "X-ray Machine" were given; in the following year, "Dandy Dick," by Pinero, and in 1898, "The Magistrate," also by Pinero, were produced. This year the play to be given is Gillett's "The Private Secretary." The Club has acted wisely and generously in the disposal of the proceeds from the plays. In 1897 fifty dollars were given to the Walker Memorial, in 1898 forty dollars were given to purchase a flagstaff for the Walker Building, and this year the proceeds are to go to the Walker Memorial Gymnasium Fund. The Managing Committee of the coming play consists of C. F. Gauss, '00, assisted by J. P. Draper, '00, and W. W. Dow, '00. The play will take place during Junior Week, although the date is not definitely fixed. It will be given at Copley Hall, and tickets will be on sale in Rogers Corridor, beginning April 10th.

ATHLETICS

The annual closed Indoor Meet was held December 17th in the "Gym." The Sophomores won the meet with 25 points, '02 was second with 21 1-2, '00 third with 15, and '99 fourth with 10 1-2 points.

Horr, '02, won the most points with 3 firsts and 1 third, and Captain Baxter was a close second with 3 firsts. Horr made a new record of 4 3-5 sec. in the thirty-five yard hurdles, and also made very good time in the forty-yard dash. Baxter did very well in the high jump and the standing broad jump. The games show that we have some very fast men in the dashes, but that we are very weak in the shot put and the pole vault. The Fall Outdoor Games showed that we are strong in the middle distances, and fair in the long distances. Following is the summary:

THIRTY-FIVE YARD DASH.—First heat won by Shepard, '01; second, Wentworth, '00. Time, 4 2-5 sec. Second heat won by Hall, '00; second, Rowe, '01. Time, 4 2-5 sec.

Third heat won by Horr, '02; second, McMaster, '00. Time, 4 2-5 sec. Heat for second men won by Wentworth, '00. Time, 4 1-5 sec. Final heat won by Horr, '02; second, Hall, '00; third, Shepard, '01. Time, 4 1-5 sec.

THIRTY-FIVE YARD HURDLES.—First heat won by Horr, '02; second, Copp, '99. Time, 4 4-5 sec. Second heat won by Shepard, '01; second, Manley, '02. Time, 4 4-5 sec. Third heat won by Wentworth, '00; second, Pope, '02. Time, 4 4-5 sec. Heat for second men won by Pope, '02. Time, 4 4-5 sec. Final heat won by Horr, '02; second, Shepard, '01; third, Wentworth, '00. Time,¹ 4 3-5 sec.

POTATO RACE.—Final heat won by Horr, '02; second, McMaster, '00; third, Emery, '00. Time, 35 4-5 sec.

RUNNING HIGH JUMP.—Won by Baxter, '01, height, 5 ft. 6 1-2 in.; second, Wentworth, '00, height, 5 ft. 5 1-2 in.; third, tie between Sherrill, '99, and Pope, '02, height, 5 ft. 4 in.

STANDING BROAD JUMP.—Won by Baxter, '01, distance,

¹ Technology Record.

9 ft. 9 1-4 in.; second, Wilder, '01, distance, 9 ft. 1 1-4 in.; third, Horr, '02, distance, 8 ft. 11 in.

PUTTING 16-POUND SHOT.— Won by Copp, '99, distance, 34 ft. 6 in.; second, Crane, '02, distance, 33 ft. 11 in.; third, McDonald, '01, distance, 32 ft. 5 in.

POLE VAULT.— Won by Baxter, '01, height, 9 ft. 7 1-4 in.; second, tie between Pope, '02, and Shepard, '01, height, 9 ft. 5 in.

FENCE VAULT.— Won by Flynn, '99, height, 6 ft. 8 in.; second, McMaster, '00, height, 6 ft. 6 in.; third, Conant, '00, height, 6 ft. 4 in.

SCORE BY CLASSES

	'99	'00	'01	'02
35-Yard Dash	3	1	5	
35-Yard Hurdles		1	3	5
Running High Jump	1-2	3	5	1-2
Potato Race	4		5	
Standing Broad Jump			8	1
Shot Put	5		1	3
Fence Vault	5	4		
Pole Vault			7	2
	—	—	—	—
	10½	15	25	21½

On February 10th, at Worcester, the Holy Cross relay team defeated the Technology team, composed of Garrett, '01, Hall, '00, Emery, '00,

McMaster, '00. Our men were handicapped by the corners of the track. Indoor races where one team is familiar with the track can not be undertaken fairly unless the track is a very large one and has easy curves. The results of such races on small tracks rarely show the comparative abilities of the competing teams.

Three cups have been offered lately to Technology athletes. Frank H. Briggs, '81, has offered one to the member of the Freshman class who wins the greatest number of points in the games for this school year. The other two cups have been offered by an undergraduate. One of these cups is to go to the best man in the weights and the other for the best man in the remaining events.

The B. A. A. Indoor Meet, which was held on February 18th, attracted considerable attention among athletes, several of whom entered the various events. The relay team was also on the programme in a race with Dartmouth. A section was assigned to Technology, and was very well filled with an enthusiastic crowd. The only Institute entry to figure in the

finals was J. W. Horr, the freshman hurdler. Horr started in the 45-yard high hurdles, from the 5-yard mark, in the same heat with Kranzelein, the U. of P. wonder, who was on scratch. Horr won this heat handily. In the finals, the men were bunched at the finish, with Horr in third position.

As the relay team came to the scratch they were greeted with a ringing Technology cheer which was kept up throughout the race, and to which the team responded nobly. Hall led off for Technology with the pole. He jumped to the front at once, and gradually moved away from his rival. On the last lap the Dartmouth man was tired, and on turning the corner next to the last he slipped and fell, but was up again instantly. As he finished his relay, Hall handed a lead of 15 yards to McMaster, and he maintained this advantage throughout. Priest was the next man to take up the running for Technology, and he added 5 yards more as he turned the lead over to Garret. The latter had already run a relay for another team, but he had no difficulty in finishing 25 yards ahead of his Dartmouth rival.

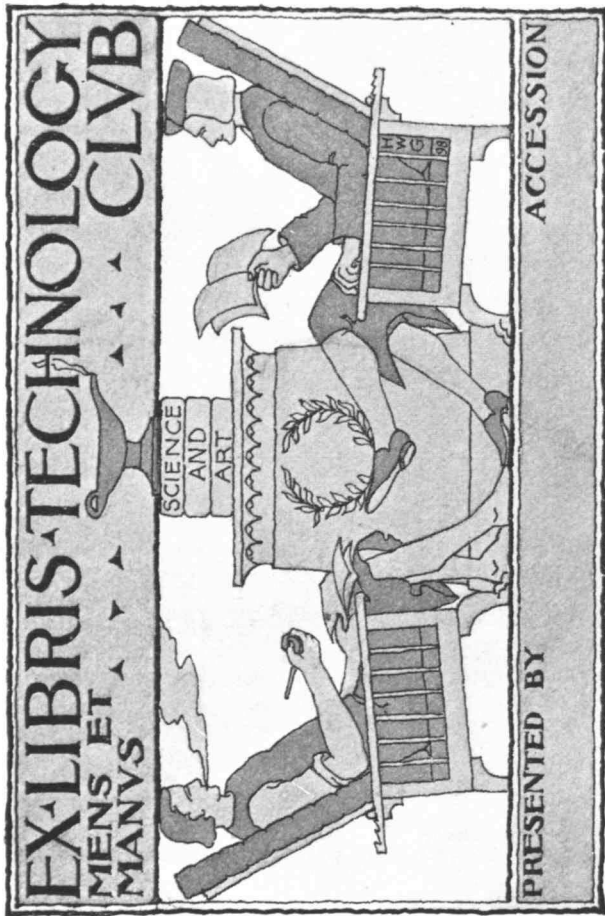
The time made for the distance was 3 min. 16 3-5 sec., which was only 4-5 of a second slower than the fastest time made during the evening. Considering the time made, and the fact that at no time was it pushed to its limit, our men feel very much encouraged, and the result shows that we have one of the fastest teams that has represented us in several years. An invitation has been received from U. of P. to take part in the relay race with Williams, Amherst, Brown, and Dartmouth. It is hoped very much that the team can be sent, as the chances for winning are very bright. The financial condition of the Athletic Association is not, however, very good at present, and the question of sending a team will probably depend on the amount which can be raised by subscription in the student-body.

Technology was well represented among the entries for the Boston College games on March 4th, and her representatives did excellent work. M. W. Hall, '00, won the 40-yard novice dash without trouble, and also qualified for the final heat in the 40-yard handicap. He was prevented

from starting in the final heat, however, by the approach of the team race. R. P. Priest, '00, shortly after running his relay in the team race, ran a fast 440 yards with Holland, of Boston College, and Fish, of Harvard. Holland won in 54 4-5 sec., with the other two close up. R. L. Shepard, '01, ran well in the 45-yard high hurdles, and was given second place in the finals in a very close finish with Ristine, of Harvard.

The team race between Technology and Columbia was a very interesting affair. The Institute feels justly proud of her representatives. Hall and Reynolds lined up for the first relay, and with the report of the pistol both men were off like a flash. Hall's spurt, however, was too much for the Columbia man, and at the first corner he was forced to drop in behind. Hall simply ran away from his man and touched McMaster's hand eight yards ahead of his rival. Mosenthal, the crack half-miler, then essayed to cut down the lead, but McMaster was too speedy for him and he increased the lead to 15 yards as he turned it over to

Priest. The latter was altogether too fast for Stevens, and had no trouble in lengthening out the gap to 25 yards. W. W. Garrett, '01, took the last relay for Technology, and Maxwell W. Long was Columbia's last representative. Long is one of the fastest men in the country at a quarter of a mile, and the crowd looked in eager expectancy to see him close up the distance and win the race. But they reckoned without Garrett. Try as he might, Long was unable to get any nearer his man, and on the last lap, to the astonishment of the spectators, Garrett began to draw away from Long, and Technology was an easy winner by 30 yards. The time was 3 min. 14 3-5 sec., and is a full second faster than has been made on this track for several years, and Technology can pride herself on having one of the fastest relay teams in the country. Garrett's work was nothing short of phenomenal. Unofficial time gives him 46 3-5 sec. for his relay, and this has not been approached on the Mechanics Hall track this season at least, and probably not for several years.



Book Plate — Technology Club.

THE TECHNOLOGY CLUB

Several events of unusual interest have taken place at the Club during the past three months, in addition to the usual smoke talks.

October 26: Excursion to inspect the Metropolitan Water-supply System.

October 27: Talk by Rev. Edward G. Porter on "The Evolution of the Modern Spaniard."

November 5: Smoke talk by Prof. Franklin H. Giddings, of Columbia College, on "The Question of the Philippine Islands."

*November 11:*¹ Talk by Dr. Paul Du Chaillu on "The Great Equatorial African Forest."

November 18: Talk by Mr. C. Howard Walker on "The Trans-Mississippi Exposition in Omaha."

*December 6:*¹ Talk by Prof. Charles E. Fay, of Tufts College, on "The Canadian Rockies."

*December 16:*¹ Talk by Prof. John O. Sumner, of the Institute, on "National Character as Illustrated by Ancient Sculpture."

December 20: Talk by Mr. Edward Gilchrist, of the Chinese Customs Service, on "China and the Modern World."

*January 27:*¹ Talk by George E. McQuesten, '93, on "Japan."

On February 3d, through the courtesy of the New England Telephone and Telegraph Company, twenty telephone receivers were placed in the Common Room of the Club, and connected with the main wire to Chicago. A large and enthusiastic body of Institute men had gathered by ten o'clock when the speeches began. The widespread storm of that evening prevented as good service as was hoped for, but the Boston speeches were distinctly heard in Chicago. In return we were saluted with the cheers of the Chicago Association, and later with music from Milwaukee. President Crafts, Mayor Quincy, and Edwin C. Miller, '79, President of the Alumni Association, all sent messages over the telephone to Chicago.

On February 20th, a complimentary dinner was given to Daniel

¹ These talks were illustrated with stereopticon views.

Chester French, '71, the sculptor of the Walker Memorial Bust, by members of the Corporation and Faculty. Addresses were made by Mr. French, President Crafts, President Drown, Prof. Charles Eliot Norton, and Mr. C. Howard Walker. It was, of course, impracticable to invite more than a limited number to the dinner, but many came in when the speeches began.

Pool, billiard, and whist tournaments have been in progress during the past few weeks. A large number of class and society meetings and dinners have been held at the Club this winter. The Club has been found a very pleasant place for the smaller gatherings. Mrs. Waldo O. Ross has recently given to the Club about forty volumes from the library of her late husband. These books had been gathered together for that purpose just before his untimely death.

THE GRADUATES

THE ALUMNI ASSOCIATION

President, Edwin C. Miller, '79; *Vice-President*, Charles T. Main, '76; *Secretary*, Augustus H. Gill, '84. *Executive Committee*: The President, Vice-President, and Secretary, Frederic H. Fay, '93 (term expires 1900), Jonathan P. B. Fiske, '89 (term expires 1899). *Alumni Committee on the School*: Edward Cunningham, '91 (term expires 1899), John Alden, '77 (term expires 1900), Horace B. Gale, '83 (term expires 1901). *Trustees of the Alumni Fund*: Edmund K. Turner, '70 (term expires 1900), James P. Munroe, '82 (term expires 1902), William S. Hadaway, Jr., '87 (term expires 1903). *Committee on William Barton Rogers Scholarship Fund*: Robert H. Richards, '68. *Committee on Associate Membership*: C. Frank Allen, '72 (term expires 1901), Richard A. Hale, '77 (term expires 1901), Walter B. Snow, '82 (term expires 1901), Harry W. Tyler, '84 (term expires 1900), William Z. Ripley, '90 (term expires 1900), Albert F. Bemis, '93 (term expires 1899), Andrew D. Fuller, '95 (term expires 1899).

Advisory Council on Athletics: Thomas Hibbard, '75 (term expires 1901), Frank H. Briggs, '81 (term expires 1900), John A. Rockwell, Jr., '96 (term expires 1899).

The Alumni Association held its annual meeting and dinner at the Exchange Club on Friday, Dec. 30, 1898.

The report of the committee on the Rogers Scholarship Fund showed that at present it amounts to \$10,878, and that five students had been assisted from it to the extent of one hundred dollars each. Since 1891, \$615 have been returned by former students, nearly half of it during the past year.

The Alumni Fund¹ amounts at present to \$1,524, no payments having been made from it for five years.

The Financial Report showed that 590 annual dues and 42 life memberships had been received, of a total of 1,689. Including the income from life memberships, a balance of ninety cents remains in the treasury. The report of the Committee on the School treated of the changes in the buildings which had taken place during the summer, and closed with a plea for greater attention to the physical training and exercise of students, and for a suitable gymnasium.

At the invitation of the President, Professor Allen of the Committee on Publication of THE TECHNOLOGY REVIEW stated briefly its inception, object, and aims. Copies of the first number were scattered about the tables of the reading-room. The magazine elicited from all the most favorable criticism.

At the dinner there were present about a hundred and twenty Technology men. The postprandial exercises were opened by President Freeman of the Association, who introduced as the first speaker President Crafts.

¹ NOTE. — The Alumni fund was raised by subscriptions as the result of a suggestion made by Prof. S. W. Holman, '76. The first subscription came due in May, 1880. "The direct object of the fund is that its income may place a larger sum at the disposal of the Executive Committee which may serve to meet unforeseen or unusual expenses incurred in the interest of the Association without having recourse to special assessments."

No class has contributed anything since '79, and "it is cordially urged that every Alumnus contribute toward the fund." — *Extract from fund circular.*

President Crafts said that the past year had been a very remarkable one for Institute men, both as citizens and members of Technology, not only on account of its events, but in its promise for the future. In speaking of the war he dwelt on the conscientious love of duty which had led Alumni and undergraduates to take part in the war with Spain. Special mention was made of Edward Dexter Brown, '90, who died at Fort Myer of typhoid.

In naval matters the President spoke of the merchant marine and navy that the nation's new imperial policy would call into existence. In this connection the work done at the Institute in Marine Engineering was mentioned, and the proposed transfer of students from the Naval Academy at Annapolis to Technology was explained. It is of interest to note that one of the objections brought forward was that the Institute had no efficient means of enforcing discipline and compelling men to study!

President Crafts told of the splendid financial condition of the Institute, and of the struggles of the late president to provide for the school in a financial way, and the speaker's only regret was that General Walker was not living to-day to see the results of the plans he had made. The recent death of John Cummings of the Corporation was alluded to. The future disposition of the Franklin Fund was discussed, and the hope expressed that it might be devoted to the Institute.

Samuel J. Elder, in speaking of "Athletics," called to mind the Phi Beta Kappa oration by General Walker in 1893. Continuing, he said: "The same love of courage and endurance that makes us prize the athlete makes us revere the lads who climbed up San Juan hill, and who won the victory at Manilla. There is in the life of every sterling people an enormous adoration for physical courage and physical strength, and it is that which school athletics nourishes. It was no idle word that Wellington spoke when he said that Waterloo had been won at Rugby and on the football fields at Eton. The subject of athletics is a great American problem."

Captain Zalinski spoke for the regular army, and declared himself as heartily in favor of enlarging it. "I think the chance of being embroiled in a foreign war," he said, "is greater to-day than

twenty years ago. The optimism of our people will lead us to take a position we cannot maintain, and sooner or later we shall have an enemy who will not give us time to prepare."

Charles H. Manning, U. S. N., told again the story of the *Oregon*.

A telegram was read from the Rev. E. E. Hale, regretting his inability to be present, and wishing the company a happy new year.

Frank H. Briggs outlined the history and policy of the Advisory Council on Athletics. He stated plainly how little the Alumni do for athletics at Technology. He described the attempts of the Council to interest the Alumni, and the discouraging way in which they responded to what concerns so closely the honor of Alma Mater.

Harry W. Tyler, '84, chairman of the special committee on the "Walker Memorial," of which Richard A. Hale, '77, and Harvey S. Chase, '83, were members, presented a report which is printed in full on another page.

The recommendations of the report were adopted unanimously.

Mr. Freeman then introduced the new president of the Association, Edwin C. Miller, '79. Mr. Miller, in entering upon the duties of his office, thanked the Association for the honor conferred upon him. He paid a high tribute to the retiring president, Mr. Freeman, for the able way in which he had served the Association during the past two years.

THE WESTERN ASSOCIATION, MASSACHUSETTS INSTITUTE OF TECHNOLOGY

President: Edward W. Rollins, '71.

Vice-President: Bradford H. Locke, '72.

Secretary and Treasurer: Frank E. Shepard, '87, 924 Washington Avenue, Denver, Colo.

THE NORTHWESTERN ASSOCIATION, MASSACHUSETTS
INSTITUTE OF TECHNOLOGY

President, I. W. Litchfield, '85; *Vice-President*, E. L. Andrews, '94; *Secretary and Treasurer*, E. McK. Hagar, '93, 556 The Rookery, Chicago, Ill.; *Executive Committee*, C. M. Wilkes, '81, Solomon Sturges, '87, L. D. Gardner, '98.



There was a merry ringing of telephone bells from the Mississippi to Cape Cod when over three hundred M. I. T. Alumni fraternized with each other over half a continent on February 3d, and with a little more preparation the dinner of the Northwestern Association in Chicago might have expanded into a national Tech banquet. The University Club was the centre of telephone disturbance, and radiating from it in all directions one hundred and thirty guests sent good cheer and the long yell along parallels of latitude and meridians of longitude, regardless of distance, with an initial force at the transmitter which seemed capable of reaching the antipodes and of lifting the white man's burden or the vaulted roof of the great banquet-hall. It was, perhaps, the largest and most enthusiastic dinner ever

held by a body of the Alumni, and because of its rather unique features was of general interest, demonstrating as it did the possibilities of long-distance speech transmission under the most adverse conditions. Through the courtesy and interested coöperation of the American Telephone and Telegraph Company and of the Chicago Telephone Company, every preparation was made to give the best possible service under the circumstances by running special trunk wires to the University Club, and avoiding submarine and underground cables. The general arrangements were made by Superintendent Stevenson of the American Telephone and



Telephone Dinner — Northwestern Association.

Telegraph Company in Chicago, while the arrangement of wires in the city and in the dining-room was in charge of E. L. Andrews, '94. There were sixty telephones in circuit at the Chicago end, a much larger number than was at first thought practicable, with a network of emergency wires and ringing circuits merging at the switchboard back of the president, where Mr. Andrews presided. Among the guests were many who had come hundreds of miles to swell the big voice, each one being identified by a little introduction card embellished with a knot of Tech colors and bearing the wearer's name and year. Distributed along the tables were standards, each bearing a talismanic number, about which the different classes rallied, from '68 down to '98 with hardly a break in the chain. Assembled in the banquet-hall, and standing each behind his chair, all joined with hearty zest in a song, and followed it with a cheer that rattled both the crockery and the waiters. Then a toast was drunk to the Institute, President Ferguson said, "Go!" and Tracy Lyon, '85, of St. Paul, began to introduce blue points into his railroad system, while Paul Fletcher, '86, of Blue Island, worked off a crustaceous story on Sol Sturges, '87, and all the "Bills," "Jims," and "Harrys," who hadn't seen each other for from one to thirty years, hugged away to make up for lost time.

The first electrical manifestation was a cablegram from London, "Electricity unites all. M. I. T., Rah, Rah, Rah." Mower got a yell which he might have heard if he had been listening. Then there was a jingling of the telephone bell, and Mr. Ferguson announced that the Milwaukee Palm Garden was on the 'phones. The orchestra that made Milwaukee famous considerably struck up "There'll be a hot time in the old town to-night," and Chicago joined in the chorus. Tomaso's orchestra in the musician's gallery at the University Club took up the refrain and synchronized the melody with their brothers in the Cream City. Right in the middle of the obsequies of a quail on toast there was another ring, and somebody shouted the magic word, "Boston!" It was Munroe, and everybody strained his ears. The sound came weak and somewhat indistinct, but audible to many, and President Crafts was introduced. He said:

My kind Hosts of the Northwestern Association: — Æsop's fable tells us how once upon a time the crane invited the fox to dinner, and put the food in a vessel with a very long and narrow neck, so that the fox could not get a taste of it. It seems to me that you have gone a great many steps farther, inviting us to dinner with a thousand miles of wire between us, and you remaining at the dinner end of the line. Let me suggest that next time you should at least give us a selenium plate, if not a dinner plate, so that we can see you eat by telegraph, and enjoy your company in that way. But it is not necessary to see you to feel sure that you are having a very pleasant time, and I send you my hearty good wishes.

It requires great confidence in your scientific integrity to communicate with you in this way, for I know that at the other end of the line is a receiver, and a proverb says that a receiver is as bad as a thief. A bad receiver might use for his own purposes my happiest ideas, or might feel that, if a speech is wired like champagne, it may also be corked up when enough has been poured out.

But I will have confidence in you, and, unaccustomed as I am to long distance speaking, I hope my feeble voice will reach you with a note of appreciation of your strong regard for your Alma Mater amid the hurry of your very active lives. The love and regard of her sons is the rock upon which the Technology builds. You go ever farther from us, North and South and West, and in rapid progress the East cannot hope to match the West, for have you not this evening found a way of hearing what I say an hour before I say it; and yet we, too, are going on in our quiet way, as Professor Dewey will tell you to-night, and trying to meet new needs with new measures, and when you come back to visit us, you will find the old Tech grown higher and broader, and very glad to see its sons at all times.

And now, if the ear at the other end of the line has listened thus far, I will end by saying that the champagne comparison reminds me that Bostonians are said to keep their feelings on ice, but, if this is the case, we have taken them off to-night, and send you the warmest and heartiest greetings.

Then Chicago burst forth into a great cheer, and Munroe said Boston would like to hear it again. Mayor Quincy, of Boston, who was at the Technology Club, was the next speaker. Mayor Quincy said:

I am very glad to extend greetings to the graduates of the Massachusetts Institute of Technology in Chicago. The Institute holds a high place in

the regard of the citizens of Boston as an institution of advanced technical learning. Three of the professors of the Institute are engaged in the official service of the city of Boston, and so are many of its graduates.

The work which the Institute is doing in meeting the demands of many lines is worthy. The condition of industry and enterprise at the present day demands the educated specialist, who is now more important than at any past age of the world. The demand both in public and private of this trained service shows how it is appreciated.

I am satisfied that the marvels of the twentieth century will eclipse those of the nineteenth. The telephone will remain one of the crowning glories of the nineteenth century. In all lines of progress the next century will make a place for trained men. It is gratifying to know that the usefulness of this Boston Institute has spread so widely. The city of Boston sends you greetings, and trusts that you hold pleasant memories of the life spent here at the Institute.

After Mayor Quincy's address there was a telephonic lull and then Mr. Andrews called up Albany, N. Y., where a special emergency wire had been run from the telephone exchange to the governor's telephone. Word came back from the governor's secretary that Governor Roosevelt had been called to New York, and was at that moment at General Butterfield's house presenting a sword to Captain Philip of the *Texas*. As there was no telephone in General Butterfield's house, it was impossible to reach the governor.

Then Orange, N. J., was called. "Give me Mr. Edison's house," said Andrews. Mr. Edison's speech was as follows:

I have been called upon to say a few words to the members of the Massachusetts Institute of Technology over the long-distance telephone, and I take great pleasure in greeting the Chicago members of the Massachusetts Institute of Technology Alumni in Chicago to-night. It is due, in a great measure, to the efforts put forth in the telephone field of research by the graduates of the Massachusetts Institute of Technology that I am able to talk with the Alumni members in Chicago to-night. I have in my employment a large number of graduates of various colleges and institutes, but the advancement and research in the electrical field is, in a great measure, due directly to the graduates of the Massachusetts Institute of Technology.

I have not prepared any set speech or greeting, and, time being limited, I wish to convey my compliments to the Alumni gathered in Chicago to-night. Good night, gentlemen.

It was perfectly clear and distinct to all and was cheered to the echo. Edwin C. Miller, '97, president of the Alumni Association sent the following message from Boston :

The Massachusetts Institute of Technology Alumni Association, through its president, sends greeting to the local association at Chicago. We congratulate the Northwestern Association on the originality of their idea (the telephone dinner), and we acknowledge our appreciation of the opportunity offered us, in unison with other alumni, of showing our loyalty to the Institute.

The New York Association, M. I. T., had made all arrangements to hold its banquet on February 4th, and as the date could not be changed this part of the programme had to be cut out. Governor Frank W. Rollins, '81, of New Hampshire, who was invited to speak, wrote as follows :

I am in receipt of your very courteous invitation to address by telephone the Northwestern Association, and I very much regret that pressing duties will prevent my doing so, as I have already written Mr. Munroe. I take the deepest interest in the Institute, and it would be a pleasure to assist in any way I might, but your invitation catches me at a very unfortunate time.

Governor Roger Wolcott, of Massachusetts, telegraphed the following :

Regret extremely that my engagements are such as to make it impossible for me to comply with your request on the evening of February 3d. Present the greetings of the Commonwealth to the Alumni of the Institute.

The following communication from President McKinley was also received :

I regret to be compelled to say that, owing to the great pressure upon his time, the President has been obliged to decline. At the date indicated in your letter the President will have a number of imperative engagements which will preclude the possibility of his meeting your wishes. Regretting

that I am unable to return a favorable answer to your very courteous inquiry,
believe me,

Very truly yours,

J. A. PORTER, *Secretary to the President.*

In the meantime, "Jimmy" Baldwin, '88, superintendent of the telephone company in St. Louis, was tugging away at the wires, and finally attracted the attention of President Ferguson. The sound was as distinct as though it originated but a block away, and the announcement was made that it had been found that there were enough Tech men in that city to form an association, and that ten were dining together. Then came individual recognition, as each man talked to classmates, and then the inevitable and unterrified Institute yell from each end of the wire. Lieut. S. D. Flood, '90, who was in Dallas, Texas, and was down for a speech, sent telegrams that he was on his way North to strike the long-distance wires, but, unfortunately, was not able to get a connection with Chicago.

After the long-distance speeches were over Toastmaster Litchfield introduced Professor Dewey, of the Institute, who had come on to represent the Faculty. Doctor Dewey's enthusiasm was contagious, and at the end of his most interesting speech he was given an ovation. He won the hearts of everybody, and he will always find a hearty welcome whenever he comes to Chicago. Mr. Samuel Insull, president of the Chicago Edison Company, spoke on "The Technical Man in Business," a very interesting subject, which was full of excellent practical advice to the young engineer in search of the main chance. Prof. B. D. Woodward, Assistant Commissioner-General to the Paris Exposition, who expected to talk about the fair, could not leave Washington in time to be present. Ensign B. R. T. Collins, '88, had a number of pictures of the new buildings, which he threw on the screen, and personally conducted his hearers through a maze of laboratories and lecture-rooms undreamed of by the older graduates. He also showed some photographs taken by him while an officer of the U. S. S. *Scorpion* during the war, and it may be said here that he was a most gallant one, too.

Between the speeches there were songs by the Mendelssohn Quartette. Stoughton Walker, '87, son of President Walker, sent a beautiful bank of roses, and efforts were made to thank him by telephone at his home in St. Joseph, Mo., but they were unavailing. The Chicago organization starts on the new year with added strength and a determination to exert it in the interests of "Old Technology," which will ever have its hearty and loyal support.

I. W. L.

THE M. I. T. SOCIETY OF NEW YORK

The fourth annual meeting and dinner was held at Sherry's, Forty-fourth Street and Fifth Avenue, on Saturday evening, February 4th, at seven o'clock. F. A. Pickernell, '85, presided, there being sixty present. The following addresses were made: Professor George F. Swain, '77, on "The Institute," Naval Constructor Bowles on "Naval Architecture," B. C. Batcheller, '86, on "Pneumatic Postal Tubes," H. Ward Leonard, '83, on "Electrical Control of Battleship Turrets," Professor C. R. Richards, '85, on the "Walker Memorial," and Captain E. L. Zalinski on "Physical Culture."

The following are members of the Executive Committee for the ensuing year: George L. Heins, '82, William B. Dowse, '74, Edward R. French, '92, Charles A. Meade, '94, and Alex. Rice McKim, '85, *Secretary-Treasurer*.

PITTSBURGH ASSOCIATION, MASSACHUSETTS INSTITUTE OF TECHNOLOGY

A directory of the Pittsburgh Association for 1899 has been prepared and distributed to its members. It shows the executive officers, and gives the names of the members alphabetically arranged with postal and telephone addresses. Sixty-eight names are included. The book is neatly bound in red morocco, and is of very convenient size for the pocket.

In Pittsburgh there is no central business district where tech-

nical men are likely to meet during the day. They are widely separated, and it is difficult for them to keep in close touch with each other. The telephone enables them, by means of this convenient directory, to maintain the right Institute relations.

THE TECHNOLOGY SOCIETY OF PHILADELPHIA

Secretary-Treasurer, Samuel S. Sadtler, '95; *Executive Committee*, Amos J. Boyden, '75, Samuel Neidich, '98, Augustus B. Stoughton, '86, Benjamin Adams, '95. Annual dinner second Saturday in November; semi-annual dinner in April.

THE WASHINGTON SOCIETY OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

For some months there has been discussion among the Institute men at Washington as to the feasibility of forming a Tech Society. As an outcome of this a meeting was called by R. E. Bakenhus, '96, for February 18th. In response to this call, about twenty-five men met at Columbian University in Washington and appointed a committee of organization, consisting of H. A. Pressey, '96, R. E. Bakenhus, '96, Theodore T. Dorman, '93, Frederick H. Howland, '93, and F. H. Newell, '85. This committee drafted a constitution, which was submitted to a meeting called on February 25th, and adopted after slight amendment.

The object of the organization, as stated in the constitution, is "to bring together former students of the Massachusetts Institute of Technology residing in or near the national capital, for the purpose of promoting the interests of the Massachusetts Institute of Technology, and of each other, through social intercourse and co-operation." A committee on hospitality is provided, to consist of a chairman and two other members, each to serve for three months, names being designated in advance and made known as widely as possible. The labor is thus divided among the members. The duty of the committee is to ascertain what Institute men are visit-

ing, or temporarily residing in Washington; to meet them, and make them acquainted with the members of the association.

A unique feature of the organization grows out of its location at the national capital, where a great part of the members are within the civil service of the government. It is proposed to keep a memorandum of the Institute men who have passed civil-service examinations, and such other facts of interest in this connection as are obtainable through correspondence. Suitable records will be kept concerning the standing of these men and their desire for transfer or advancement along various lines. It is hoped to encourage graduates to take the civil-service examination for engineering or other positions under the government. The association should be able to give information or advice to those who have ambitions in this line. It is also proposed to keep on file information concerning the entrance examinations to the Institute. It is expected that the records of the association will show that efficiency and success in the engineering or scientific work of the government is promoted by the training acquired at the Massachusetts Institute of Technology.

The officers elected on February 25th, for the ensuing year, are: *President*, F. H. Newell, '85; *Vice-President*, H. A. Pressey, '96; *Treasurer*, Frederick H. Howland, '93; *Secretary*, R. E. Bakenhus, '96. These, with one additional member, F. E. L. Beal, '71, constitute the Executive Committee.

THE ASSOCIATION OF CLASS SECRETARIES

A meeting held on January 5, 1899, at the Technology Club, was attended by twenty members. The secretary was authorized to publish a new list of members with addresses. Copies may be had on application.

The Committee on Publication for THE TECHNOLOGY REVIEW reported favorably on the future prospects of the Review, but stated that its success depended now upon securing additional advertising and subscribers. It is hoped and expected that all

Institute men will help. THE REVIEW shows such promise and fulfilment as to warrant the best treatment. A little effort on the part of Institute men generally would place THE REVIEW on very firm ground, and leave the committee with more freedom for other work.

The special joint committee on a Walker Memorial, of which H. W. Tyler, '84, was chairman, made its report at the Alumni Association Annual Meeting. This report is published in full in another column.

NEWS FROM THE CLASSES

[The success of this department must depend on the items furnished. It is earnestly requested that the members of the classes assist their class secretaries by sending any possible materials to them or direct to the Editor.]

1868.

PROF. R. H. RICHARDS, *Sec.*
Mass. Inst. Technology, Boston.

1869.

HOWARD A. CARSON, *Sec.*
20 Beacon Street, Boston.

The secretary is travelling in Europe and will not return until the middle of May.

1870.

PROF. CHARLES R. CROSS, *Sec.*
Mass. Inst. Technology, Boston.

W. C. Dickinson is in business in St. Louis, Mo.—A notice of the death of Waldo O. Ross may be found near the end of this number.

1871.

EDWARD W. ROLLINS, *Sec.*
Denver, Colo.

F. E. L. Beal is assistant biologist with the Biological Survey, United States Department of Agriculture, in Washington. His particular work is studying the food of birds, by the somewhat prosaic method of examining the contents of their stomachs. In the past seven years he has examined over ten thousand and has tabulated and published some of the results.—Daniel Chester French is at present engaged upon an equestrian statue of Washington to be erected in Paris in 1900; upon three pairs of bronze doors for the Public Library, Boston; a statue of General Meade; an equestrian statue of General Hooker; a bust of Bishop Brooks; and a medal to be

given by the United States to Admiral Dewey, his officers and men. — J. Foster Bush, 651 Boylston Street, Boston, after leaving the Institute, graduated from the Harvard University Medical School, in '74. Since that date, he has been connected with the Massachusetts General Hospital, and was surgeon at the Boston Dispensary for a number of years. At the present time, he is one of the executive committee of the Children's Mission, and is the visiting physician there. He is also one of the councillors of the Massachusetts Medical Society. — Henry M. Nourse, 29 Pemberton Square, is following the profession of architecture. — Joseph D. Sawyer is in the railway signal business, 55 Liberty Street, New York. — Frank C. Childs is a member of the firm of S. C. Nightingale & Childs, 451 Atlantic Avenue, Boston; principal business is manufacture of magnesia sectional coverings, and dealing in fireproof and non-conducting materials. — Joseph F. Gibbs is living in Waltham, and is cashier of the Waltham National Bank.

1872.

PROF. C. FRANK ALLEN, *Sec.*
Mass. Inst. Technology, Boston.

R. H. Soule is at present the Western representative of the Baldwin Locomotive Works, with which he has been connected for a year and a half, a position for which his previous experience well qualifies him. After his graduation, he spent a short time with the Southwark Foundry, after which he joined the forces of the Pennsylvania Railroad. There he remained for many years, some of his earliest work being in connection with the interlocking system at the Centennial Exposition, when interlocking was new in this country. Later in his history he was general agent of the Union Switch and Signal Company, although most of his time has been spent with railroad companies as superintendent of motive power. He served in this capacity on several divisions of the Pennsylvania system and with allied companies connected with it. He was afterward with the New York, West Shore and Buffalo Railroad and also with the New York, Lake Erie and Western Railroad, of which he

was later general manager, at the time S. M. Felton, '73, was vice-president. He was for several years superintendent of motive power of the Norfolk and Western Railroad, from which position he resigned to accept his present work with the Baldwin Locomotive Works. Mr. Soule became a member of the American Society of Mechanical Engineers in 1880, of the American Master Mechanics' Association in 1891, and of the Master Car Builders' Association in 1892. He was during the same year appointed by the latter body as one of the Board of Editors of the "Car Builders' Dictionary," which was published in 1895, and was at one time a member also of the executive committee. In 1896-7 he was president of the American Railway Master Mechanics' Association. Since his connection with the Baldwin Locomotive Works he has made a trip abroad in its interest, and during that time very large orders, notably from Russia, have been received by the Baldwin Locomotive Works, although Mr. Soule is modest enough to suggest that the most important work was done by the local representatives

of his company. — The presiding officer at the annual meeting and dinner of the Massachusetts Highway Association, in February, was C. Frank Allen, the president of the association for the past year, and now president of the Boston Society of Civil Engineers.

1873.

SAMUEL E. TINKHAM, *Sec.*
City Hall, Boston.

Mrs. Ellen H. Richards is lecturer on sanitary chemistry in the Western Reserve University. She has visited various colleges throughout the middle West, and has explored carefully the educational field. She finds that the laboratory method of teaching science, the most serviceable construction for large laboratories, manual training as an educational factor (ideas first put into concrete form at the Institute of Technology), are found in all the progressive schools from the grammar school to the university. It is very interesting to one who has watched these educational elements grow in the Institute to find them so fully organized in these later schools. — Capt. Henry L. Ripley writes from Fort Ethan Allen, Vt.: "My service has been almost

entirely in the West, in Texas, Indian Territory, and Kansas, until I came here in the fall of 1895. I served as engineer officer in the department of Missouri, for two years, on the staffs of Generals Miles, Potter, Wilcox, and Ruger, and in a like position in the department of Texas, for two years, on the staff of General Wheaton. Graduated at the head of my class after a two years' course at the U. S. Infantry and Cavalry School, at Fort Leavenworth, Kan., in June, 1885. Saw some service against the Indians in the Indian Territory, and against the insurgents under "Garza" on the lower Rio Grande, in Texas. Went to Cuba in command of my troop, with Wheeler's division, Shafter's Fifth Army Corps, and was in the fight of San Juan Hill on July 1st and 2d, in which actions my troop lost two men killed and nine wounded. Was also present and took part in the bombardment of Santiago, July 10th and 11th, and was present at the surrender July 16th. Shortly after the surrender we moved back into the hills not far from El Caney, where we remained in camp until we came to Mon-

tauk Point, August 14th, where we remained until September 23d, when we came back here. I am still in the service, and being a 'regular, not a hero,' shall probably remain in it, as long as I live."

1874.

CHARLES F. READ, *Sec.*

47 Cypress Street, Brookline.

The great event of the year for the class has been the dinner celebrating the quarter-centennial of graduation, given in Boston on the twenty-first of February. It was "ladies' night," and most of the members were accompanied by their wives, thereby, as one of them said, doubling the size of the class. Pres. William E. Nickerson presided at the literary exercises following the reception and dinner, and introduced the Hon. Walter L. Bouvé as the orator of the occasion. Mr. Bouvé eulogized the Institute of Technology as exerting a wider influence than any school of its kind in the country. "For the broad culture it offers," said he, "and the unequalled thoroughness it demands from its graduates, it has attracted the admiration of the whole world of scholarship."

"May he live long to pluck the fruit of the tree of knowledge for successive classes," was the sentiment with which President Crafts of the Institute was introduced. The president, in an unconventional way, related anecdotes from his wide scholastic experience. Remarks largely in a reminiscent vein were made by Prof. Robert H. Richards, Prof. Charles R. Cross, and Prof. Gaetano Lanza. The speaking was interspersed with a varied musical programme, consisting of singing by Mrs. Charles C. R. Fish and Mr. Clarence E. Hay, with piano selections by Miss Alice M. Nickerson, a sister of President Nickerson. Mrs. Willis R. Russ read a dainty original poem, dedicated to the class of '74, and in response to an encore recited an original sketch, entitled "A Rug Auction on Boylston Street." "The boys" were especially interested in a poem written for the occasion by Secretary Read. The absence of Professor Runkle was deeply regretted. He had been president of the Institute during the entire period of their college life. The officers of the class are: William E. Nickerson,

president; Willis R. Russ and George B. Frye, vice-presidents; Charles F. Read, secretary and treasurer. Members present, in addition to those already mentioned, were Herbert Barrows, George H. Barrus, William T. Blunt, Edward C. Browne, John C. Chase, George T. Elliot, Charles C. R. Fish, Gideon M. Mansfield, William P. Robinson, Albert C. Warren, and Henry K. Burrison, with their ladies. — William T. Blunt is United States assistant engineer in charge of the steamer *Visitor*, with office in Cleveland, Ohio. He extends a cordial welcome to all Institute men.

1875.

E. A. W. HAMMATT, *Sec.*
29 Pemberton Square, Boston.

The annual meeting of the class was held at Young's Hotel at 7.20 P.M., January 12, 1899. The records of the last meeting were read and approved, as were the reports of the secretary and treasurer. The following officers were elected for the year 1899: President, Thomas Hibbard; vice-president, B. L. Beal; secretary and treasurer, E. A. W. Hammatt; executive com-

mittee, B. L. Beal, C. H. Williams, S. J. Mixer. As the year 1900 marks the twenty-fifth year after graduation, it seemed desirable that some special features should be introduced at the next meeting, and the president and secretary in conjunction with the executive committee were appointed a committee for the purpose. — B. L. Beal, who was in newspaper work for several years, has been secretary of the Boston Transit Commission since its organization. He is a member of the St. Botolph and Papyrus Clubs. — Frank S. Dodge has been in the government service in Honolulu since 1885. In connection with his work in government survey, he has held the following commissions: Boundary commissioner, First Judicial Circuit; grade commissioner, City of Honolulu; grade commissioner, City of Hilo, Hawaii; Electrical Railway, 1895-96. He had five years' service with the First Company of Sharpshooters of Hawaii, two years as captain. He has resigned all office under the government, and is now land agent and executive officer of the Bishop trusts, Honolulu. —

Thomas Hibbard is treasurer of the George Lawley & Son Corporation, South Boston. — J. H. P. Hughart, who has been with the Grand Rapids and Indiana Railroad since 1874, is now general manager. He is also somewhat of a club man, being a member of the Peninsular, Country, Kent Golf, and Schubert Clubs of Grand Rapids, the Detroit Club of Detroit, and the Reform Club of New York. — Wilfred Lewis has been with William Sellers & Co. since graduation. He is a member of the A. S. M. E., the Engineers' Club of Philadelphia, the Franklin Institute, etc. — L. A. Roby, who was connected with the Otis Steel Co. for many years, is now with the Ferro-Steel Co. of Cleveland. He is a member of the Cleveland Chamber of Commerce. — W. F. Sargent, who for some years was in Chicago, is now agent and general manager of the Atlantic Refrigerating Co., with headquarters at 146 Franklin Street, Boston. He is a member of the Wellesley Club, and lives at Wellesley Hills. — The secretary would say that, from replies to his circular asking for information, the men of '75

seem to have kept out of politics; though only a limited number have as yet sent in returns.

1876.

JOHN R. FREEMAN, *Sec.*

Providence, R. I.

Clarence M. Boutelle is superintendent of public schools at Marshall, Minn. — Prof. W. O. Crosby has during the past three years been engaged upon extended geological work for the Metropolitan Water Board, which is constructing very extensive works for the supply of Boston and the adjoining municipalities, Professor Crosby working in coöperation with the engineers of the Board. He has made a very extended geological study of the Nashua Valley, in the vicinity of Clinton, and special studies to determine the character of materials likely to be encountered in the construction of tunnels, dams, and dikes. The tunnel, two miles in length, has now been completed, and his predictions have been fully verified. In addition to work for the Board, he has, on his own account, made a study of the whole Nashua Valley, and gave a very interesting talk upon this sub-

ject at a meeting of the Society of Arts last December. — Harry Tracy Buttolph has for the past four years been assistant chief engineer to the city of Buffalo, and during that time has had general oversight of the office. For the previous fourteen years he had general engineering charge of the construction of pavements in Buffalo, which city has the distinction of being the best paved city in America, with the possible exception of Washington, D. C. The first asphalt pavement put down in Buffalo was under the immediate charge of Mr. Buttolph. Buffalo has to-day 327 miles of paved streets, of which 212 miles have an asphalt surface laid on concrete, macadam, or paving stone foundation. More than 150 miles of this has been put down under Mr. Buttolph's supervision. A considerable amount of this work has been the resurfacing of a variety of stone pavements with asphalt, and many original problems have been successfully worked out by Mr. Buttolph, in the effort to secure economy and utilize old material. — F. K. Copeland is president and chief hustler of the Sullivan Machinery Company, which manufactures

diamond drills, coal cutters, and mining machinery, with shops at Claremont, N. H., and Chicago, and has for some years given his attention more to the selling end than to the engineering end of the business. After leaving the operating department of the C., B. & Q. Railroad, he was for some years engaged in the mining of coal, as engineer and superintendent, which experience has been of great practical value to him in the development of their special lines of machinery.—Frank W. Hodgdon, chief engineer of the Massachusetts Board of Harbor and Land Commissioners, is particularly busy at the present time planning the engineering work on various improvements, particularly that for Green Harbor, Mass., for which an appropriation of \$67,000 has been made, and in devising the best forms and methods of construction for the new pier at South Boston, for which the State has made an appropriation of \$400,000. The construction of this new pier marks a very notable improvement in the harbor facilities of Boston; the work in the main consisting of constructing, in front of the filled flats owned

by the Commonwealth, a wharf or pier twelve hundred feet long and four hundred feet wide, with thirty feet of water in the docks alongside of it at mean low water, which will accommodate the largest vessels likely to come to this port. The Commonwealth proposes to retain the title of the water front it now holds, and to lease the various wharves and slips, so that they will be managed for the best interests of commerce. The pier now under construction consists of a solid core of 1,150 x 300 ft., enclosed by a stone sea wall on a pile foundation, the filling being excavated from the docks on either side. The work will be completed early the coming season. This core will be surrounded by an oak pile platform, fifty feet wide, for which bids have been received during the past few weeks. It is expected that this large pier will be followed by others, as they are needed, until the entire frontage of a mile or more is so occupied. Of the land in the rear of those piers, one hundred acres or more is for sale, and the remaining one hundred acres will be retained by the Commonwealth, to be used in con-

nection with the water front. On the East Boston side of the harbor, an area of one hundred acres of flats has been acquired by the State during the past year, to be held until such future time as it may be needed for piers and docks. Mr. Hodgdon finds much other work to keep him busy, in looking after the improvements carried on by the Commonwealth, through the Board of Harbor and Land Commissioners, in improving the smaller harbors to serve as boat harbors for fishermen and summer visitors. Plans have recently been made for such work at Menamsha and Cottage City, at Osterville, Scorton Harbor, and Green Harbor. Work has already been begun at Green Harbor and Osterville, and that at Scorton Harbor is already completed. The plans provide for excavation of channels and protection of their entrances by stone and timber jetties. — Charles T. Main is a member of the Executive Committee of the Society of Arts.

1877.

RICHARD A. HALE, *Sec.*

Lawrence, Mass.

E. H. Gowing is interested

in the Acme Water Storage and Supply Apparatus. — The annual class meeting was held February 20th, with nine members present: Harry C. Southworth, of several grade-crossing commissions; G. A. Nelson, assistant city engineer of Lowell; Wm. H. Beeching, engaged in cork and sponge importing; W. B. Bradford, connected with the Geo. F. Blake Manufacturing Co.; John Alden, chemist at Pacific Mills; F. J. Sherman, in business at Foxboro; Benjamin C. Mudge, in the coloring and dyeing business in Charlestown. Others who were expected did not come. George F. Swain, who had been assisting in entertaining President McKinley, and Joseph P. Gray, of the Mutual Fire Insurance Co., had to decline at the last moment. No speeches were made, but the usual informal social talk was had. Comparisons of business, discussion of mining stocks, and a comparison, in general, of families, etc. A letter received from G. Walter Capen announced his intention of entering the bonds of matrimony soon. An interesting letter was received from George A. Freeman, architect, of New York,

also one from William H. Lawton, of Newport. Meeting was adjourned for one year. The same officers hold over. — George F. Swain visited Wiliston Academy, Easthampton, recently, giving a lecture on the "History of Bridge Building" to the students and many of the town's people. The usual reception was given by Mr. and Mrs. Sawyer at their home before the lecture.

1878.

LINWOOD O. TOWNE, *Sec.*

Haverhill, Mass.

The class had its annual supper and twentieth anniversary, at Young's, the evening of December 28th. The president, C. M. Baker, occupied his usual seat at the head of the table, and there were also present: Collier, Draper, Eaton, Higgins, Rich, Sargent, Schwamb, Williams, and Towne. The only "proceedings" were the discussion of what, in the language of one of the letters from absent members, makes up a "modern '78 supper," — a thing not to be lightly approached when convalescing from the grip. Among the good things offered as a fitting climax to this double decade after graduation was the

announcement of the first pair of class twins. The class unanimously agreed to receive Theodore Alderson Schwamb and Edward Bailey Schwamb as new, honorary, and welcome members of '78, and look forward to their graduation from Tech in the class of 1920 or so. A great honor for '78 (and likewise the Institute) was made known during the evening in the eminently discriminating selection from the class, of Eben S. Draper, of Hopedale, as a member of the Corporation. Mr. Draper is already well known throughout the country, and has been conspicuously before the Massachusetts public as chairman of the Republican State Committee.

1879.

HARRY H. CAMPBELL, *Sec.*

Steelton, Pa.

At the annual meeting and dinner of the class, held December 29, 1898, at the "Arena" in New York, the officers for the coming year were elected as follows: President, W. S. Allen; vice-president, V. C. Spicer; secretary and treasurer, H. H. Campbell; business committee, H. J. Howe, A. M. Waitt.

It was decided to make the directory to be published next year somewhat full and elaborate, and to insert photographs of the members, with biographical sketches, and a committee was appointed, composed of Allen, Coffin, and Miller for New England, and Lane for the New York district, and Spicer for the West, to stir up the members to give full accounts of their lives. — The secretary would be very glad to hear from anybody ever connected with the class who is now not enrolled on the list of the Class Association.

1880.

PROF. GEO. H. BARTON, *Sec.*
Mass. Inst. Technology, Boston.

1881.

FRANK E. CAME, *Sec.*

17 Place d'Armes Hill, Montreal.

Thomas Nelson Hastings, of Walpole, N. H., is president of the New Hampshire Senate. He was formerly connected with the Bijou Theatre in Boston, and now owns a large farm at Walpole, N. H., where he permanently resides. — Frank E. Came is a life member of the Montreal Amateur Athletic Association. — Col. Frederick T.

Walsh was married last October to Miss Katherine Bingham, of Littleton, N. H. — It is now "Governor" Frank W. Rollins, of the State of New Hampshire. — George A. Mower is general manager of the Sturtevant Engineering Company in London, England. — John Duff, M. D., of Charlestown, Mass., is an active member of the Bath Commission.

1882.

WALTER B. SNOW, *Sec.*

Watertown, Mass.

The seventeenth annual dinner was given at the Technology Club, on Friday evening, February 3d. Brackett, Ely, French, Gerry, Gooding, Hersey, Manning, Mansfield, Munroe, W. B. Snow, Warren, and Walker — twelve in all — were present. Six more were expected to attend, but through one cause and another were prevented. Long-distance telephonic communication with the Northwestern Association and the large gathering of Club members assisted greatly in rendering it an extremely pleasant class meeting. — Harry W. Jones is a member of the Minneapolis Board of Park Commissioners. — James P. Munroe is secretary of the

committee appointed to draft and present to the General Court a bill for reorganization of the School Committee of Boston. — The engagement of Rufus F. Herrick and Miss Burley, of Winchester, Mass., is announced. — The present home address of Frank V. Strickland is 5 Broadway, Bangor, Me. — Francis P. Hall is director of the School Board of District No. 91, Lyon County, Kansas. — Walter B. Snow and James P. Munroe are members of the Twentieth Century Club. — Howard V. Frost was in Boston late in January, but was unable to remain until the class dinner. — Fred M. Gooding's permanent address is now care of H. P. Sherman, Waltham, Mass. — Henry E. Snow is now of the Snow, Mackay Advertising Agency, 194 Washington Street, Boston. — Harry G. Manning has recently been conducting experimental tests of Pelton water wheels in connection with alternating current generators for long-distance transmission of electricity for shop power at Fitchburg, Mass. — George W. Mansfield, whose permanent address is now Melrose Highlands, Mass., is interested in "The Monitor Nozzle,"

with office at 4 State Street, Boston. — Charles D. Jenkins is director of the Calumet Club, Winchester, Mass. — One of the directors of the Portland, Oreg., Library Association is Winslow B. Ayer. — Rufus F. Herrick has been acting as consulting chemist for tanneries, and has been particularly identified in the coloring and finishing of "chrome tanned" calf skins upon a practical scale. — George L. Heins has been appointed capitol commissioner by Governor Roosevelt of New York. — A. N. Mansfield has gone abroad in the interest of the American Telephone and Telegraph Company.

1883.

HARVEY S. CHASE, *Sec.*
8 Congress Street, Boston.

Winthrop Alexander has recently opened an office as architect in Stoughton, Mass., after nearly twenty years' experience on various kinds of construction for national, state, and city governments in Washington and elsewhere.

1884.

PROF. A. H. GILL, *Sec.*
Mass. Inst. Technology, Boston.

George T. Jarvis is receiver

of the Louisville, Evansville, and St. Louis Railroad. It is rumored that after the sale of this property, he will be made the general manager of the company. — Dearborn, formerly superintendent of the Beach Manufacturing Co., of Beacon Falls, Conn., is with the Nonantum Worsted Co., of Newton. — D. W. Park is at Merced, Cal., with the Boston & Montana Mining Co. — We hear that W. L. O'Brien, lately of the *Minneapolis Times*, is in the real estate business, corner of Twelfth Street and Hennepin Avenue, in that city. — Barrett L. Chandler is of the firm of the Chandler, Beckwith Co., 193 Emmett Street, Newark, N. J., manufacturers of fine varnishes. Mr. Chandler was for many years chemist with Valentine & Co., the celebrated varnish makers of New York. — Miss E. O. Conro, who for a long time was in charge of the department of domestic science at the Pratt Institute, is now principal of St. Catherine's School, Brooklyn, N. Y. — The newspapers say that General J. F. Weston, who saw service in Cuba, will succeed General Eagan as chief of the Commissary Department. — Kennard

writes that the U. S. Sugar Refining Co., of which he was the treasurer, has, like most other good things, been absorbed by other parties, and he is at present quite unsettled. — Many of us remember when we had no less than nine Chinese students with us, or about four per cent. of the school. These were all recalled during the summer of 1881. They were educated at government expense, and tradition has it that one who had been educated abroad, upon being brought into the emperor's presence, spoke his mother tongue so indifferently as to anger his Majesty to the extent of recalling all those studying in foreign countries. Of the six in '84, two perished in the Franco-Chinese War, as the following account from *The Tech* indicates. "They became lieutenants in the army (navy), and in the battle of Min in 1885 displayed great courage and manliness. Yung Chung Kwong, '83, whose superior officers had been killed by a French broadside, showed his spirit by firing a broadside at his deserting men and another at the French, and sunk with his ship in the act of levelling another gun at the enemy. Sen

Nam Yang, '84, and Yan Foke Sik, '84, were killed on board the flagship, *Yang Woo*, which is reported with one or two others as having fought well." —The annual meeting and dinner of the class took place at the Technology Club, February 23d. —A. Lawrence Rotch is still professionally engaged in the management of the Blue Hill Meteorological Observatory. The use of kites to obtain meteorological data at the height of a mile or two, which was originated at Blue Hill, has given important results, and has been followed elsewhere in the United States and in Europe. Mr. Rotch attended the meeting of the International Aeronautical Committee, of which he is the American member, at Strasburg, last spring. He has this winter been delivering a course of lectures before the Lowell Institute on "The Exploration of the Atmosphere, including the Use of Balloons and Kites." —Keshar M. Bhat writes from 111 Jogeshuari Lane, Poona, Ind.: "I am extremely glad at the idea of starting a quarterly magazine of our beloved Institution under the name of TECHNOLOGY REVIEW. The object

is noble and will not, I hope, fail to secure the coöperation of the sons of our institution. Ever since I left the State of Miraja I had a mind to start a small dyeing house; but famine and pestilence which ravaged this country during the last two years hardly left any hope of personal safety, much less of undertaking and managing a small business. The famine is now over and, though the plague is still making havoc in some parts of this country, the town of Poona is safe, and I hope will remain so to give us breathing time. My son, Mahadeo Keshaw Bhat, a lad of nineteen, has just finished his high school course. I mean to initiate him into this dyeing business and with his help and assistance to work the small dyeing house. It will not be out of place to make mention of the fact that the invaluable practical knowledge I got at our beloved institution, and also from the factories round about Boston, has been of immense use to me, but for which I should not have been where I am. I have informed from time to time my classmates of '84 as to how I fared in this land. The credit

of clearing my character—when people accused me of ill-spending my time and money in America—is to a very great extent due to the Massachusetts Institute of Technology, and the credit of the success that I might or rather wish to achieve in my new undertaking, small though it is, will also be due to our institution, and therefore I don't hesitate to call myself a son of Massachusetts Institute of Technology. I shall ever regard this institution, the very kind American friends and factory owners who helped me, with respect and reverence as my Vedic religion teaches, for it says, 'Respect him like your father who imparts you knowledge.' Convey these my humble thoughts to my American friends and classmates."

1885.

ARTHUR D. LITTLE, *Sec.*

7 Exchange Place, Boston.

I. W. Litchfield was elected president of the Northwestern Alumni Association at its annual dinner, February 3d. A report of the dinner, which was a notable one, will be found elsewhere in THE REVIEW.—Arthur H. Doane has been appointed General Sales Agent

of the Union Pacific Coal Company, with headquarters at Omaha.—John T. Haines, 1st Lieutenant and Quartermaster 5th U. S. Cavalry, is convalescing from a severe attack of typhoid fever contracted in camp.—Manuel E. Recuero, in addition to his duties as treasurer of the Panama Water-works, finds time to act as correspondent for some eleven American, French, and Spanish journals, among them the New Orleans *Picayune*.—Parker C. Choate has devoted himself to the treatment of complex sulphide ores. He has recently erected a new plant at Portland, Maine, for the manufacture of zinc white, and is now adding a plant for sulphuric acid.—Oakes Ames is one of the incorporators of the Massachusetts Telephone and Telegraph Company, which has secured a franchise in Boston.—F. H. Newell, chief hydrographer, U. S. Geological Survey, read a paper February 15th on water conservation before the American Paper and Pulp Association at the Waldorf-Astoria.—Charles Alva Brown, who still remains a member of the firm of Charles D. Brown & Co., has recently

been elected treasurer of the Somerset Fibre Company, a director in the Kennebec Fibre Company, the Rumford Falls Power Company, and the Benton and Fairfield Electric Railroad. — Everett Morss is in Europe on a short business trip. He will visit London, Paris, and one or two places in Germany before returning. He has been elected a member of the Walker Memorial Committee. — A letter from Donald MacRae, in Wilmington, says: "When war was declared I was serving as captain of the local company, belonging to the Second Regiment of the North Carolina State Guard. Our governor gave the companies of the Guard an opportunity to volunteer as a part of North Carolina's quota under the first call, and I called for volunteers from the men of my company. About sixty per cent. of them responded, and I then proceeded to recruit the company to the required strength with outsiders. We were mustered into service as Company K, Second North Carolina Volunteer Infantry, on the thirteenth of May, and remained in camp at Raleigh, N. C., until about August 1st, when

four of our companies, including my own, were ordered to St. Simon's Island, opposite Brunswick, Ga. Our experience while at Raleigh was rather a trying one, as the weather was very hot and dusty, and the work hard, but at St. Simon's we were very pleasantly situated by the seashore, where we had plenty of facilities for salt water bathing, with refreshing breezes night and day. We were fortunate, however, in leaving there when we did, for the reason that a very severe equinoctial storm swept over the island three days after our departure, overflowing our former camp-ground to a depth of four or five feet, and, as the facilities for rescue were very limited, it is not improbable that one-half of our men would have been lost if we had remained." — Robert R. Goodrich was, after graduation, for five years mining engineer in the New River coal fields on the Chesapeake and Ohio Railroad; for three years mining engineer and colliery manager in the Pocahontas coal fields; for two years in the real estate business in El Paso, Texas; for four years with the Chihuahua Mining Company, of Chihuahua,

Mexico, first at the smelter, later at the mines. During the past year he has been superintendent of their mines at Cusiuhuiachic, and he is now taking a course in mechanical engineering at the Institute. — F. H. Newell was elected president of the Washington Society of the Massachusetts Institute of Technology at its first meeting, February 25th. — F. A. Pickernell presided at the annual dinner of the M. I. T. Society of New York at Sherry's, February 4th. Alex. Rice McKim was elected secretary-treasurer of the society, and C. R. Richards spoke on the "Walker Memorial." — Everett Morss was elected a member of the executive committee of the Alumni Association at the annual meeting, December 30, 1898. — Richard E. Schmidt has been practising architecture alone since '95. He has built a large hospital in Chicago and another in St. Louis, an exposition building at the Omaha exposition, and is now engaged on a twelve-story building in Chicago.

1886.

PROF. ARTHUR G. ROBBINS, *Sec.*

Mass. Inst. Technology, Boston.

F. J. Kingsbury, Jr., of New

Haven, Conn., is secretary of the Bridgeport Brass Company. — Charles F. Richardson is counsellor-at-law in Boston and is particularly interested in patents and patent litigation. — Col. Frank L. Locke writes: "My service in the Spanish War was little. At the outbreak of the war I was called to the Adjutant-General's office for duty, in connection with the organization and equipment of the Massachusetts Volunteers. I was on duty in this office for several days. During the war I was called upon at different times for duty in this line; for the regular inspection of our militia encampments on the coast; for duty in connection with the organization of provisional militia; and for duty aiding in the reception and care of the sick, as they returned from the front. I saw no active service."

1887.

EDWARD G. THOMAS, *Sec.*

4 State Street, Boston.

The regular annual meeting of the class was held at Young's Hotel, February 21, 1899, there being present Adams, Bryant, Cameron, Conant,

Coburn, Chase, Draper, Davenport, Hussey, Lane, Saunders, Sears, C. K. Stearns, Spaulding, Sprague, E. G. Thomas, Wakefield, and W. A. Whitney. As the president, Mr. Stewart, is spending the winter in the South, Mr. Hussey presided. After the reports of the secretary and treasurer of the class and of the trustees of the Class Fund were presented, the following officers were elected for the ensuing year: President, Oren S. Hussey; vice-presidents, Morton E. Cobb and F. Manton Wakefield. — Lyman Farwell is now at Dawson City in the Klondike. — Frank E. Shepard is president of the Denver Engineering Works, Denver, Colo. — Granger Whitney had an interesting experience in the war. He saw service on the U. S. S. *Yosemite*. He writes: "From Key West the *Yosemite* was ordered to Havana, where she received orders to convoy the *Panther*, with seven hundred marines, to Santiago. Arriving at Santiago, we were ordered to convoy the *Panther* to Guantnamo, and land the marines. The marines were landed, and founded Fort McCalla, and saw

land service. The *Yosemite* was then ordered to do patrol duty south of Cuba. She ran into Kingston, Jamaica, and returned to Santiago, having been absent about a week. She was then ordered to Porto Rico, to relieve the *St. Paul*, which was blockading the port of San Juan. This was the most important and exciting service the *Yosemite* saw. At 5 A. M., June 28th, general quarters was sounded, and the watch below tumbled on deck, to see a large ship coming out of the morning mist, and making for the harbor. A shot was fired across her bow, and as she did not heave to a shot was sent directly at her. Her captain turned her, and made for the shore under full speed, the *Yosemite* chasing. Soon the Morro Castle opened fire, also a sand battery on shore. Shortly after, three gunboats and a torpedo-boat were seen coming from the harbor, and things commenced to look exceedingly interesting. The Spanish ship, the *Antonio Lopez*, ran upon a coral reef about a mile from the shore, and her crew disembarked. The *Yosemite* continued to fire on her until she wrecked her, and then

found herself within the range of the 9-inch guns on the gunboats, and the 8-inch guns of the *Morro*. Being unable to do any damage with her 6-inch guns, she withdrew, and mess was piped. Just as we were through eating, general quarters was again sounded, and we rushed on deck to see the gunboats steaming down the harbor, and the *Yosemite* steaming up to meet them. We soon engaged, and after about an hour's fighting, forced the enemy to retire, striking one boat twice, and another four times, partially disabling her. The *Yosemite* was fortunate enough not to be struck."—Henry J. Conant is manager of the Boston office of Westinghouse, Church, Kerr & Co., and has had charge of their interests in the Terminal work from the beginning. He has recently been appointed to a more important executive position in the company.

1888.

WILLIAM G. SNOW, *Sec.*
Watertown, Mass.

H. F. Bigelow has become a member of the firm of Winslow & Wetherell, architects, Boston. The name hereafter will be

Winslow, Wetherell & Bigelow. — Stephen Child is deputy street commissioner of Newton, Mass. — Fourteen members attended a very enjoyable class dinner at the Technology Club, on Saturday evening, March 4th. At the business meeting A. H. Sawyer was elected president. Arthur T. Bradlee was appointed a committee to select the gift of the class to the Technology Club. A fair sum for this purpose has already been raised. Any desiring to add to it are invited to send the amount to Mr. Bradlee, 78 Chauncy Street, Boston. — Richard Devens has gone abroad to represent the Brown Hoisting and Conveying Machine Company of Cleveland, O. His address is 39 Victoria Street, S. W., London. — Wm. H. Gerrish is in the ordnance office, War Department, Washington, D. C. — L. A. Ferguson has recently returned from a trip through the South and West, visiting Mexico and California. — The Stone & Webster syndicate secured control of the Lowell Electric Light Company, February 1st. — The marriage of Edward Clapp Holton, of Cleveland, O., with Miss Lydia M. Bultman, of that city

is announced. — The secretary desires the addresses of André, Hix, Hampton, Willingham, J. V. Wright, and Pitman. — Fred R. Nichols is a teacher of physics in the English high and manual training school of Chicago. He has taught in various places since leaving the Institute: Memphis, Tenn., Berea, Ky., Brooklyn, N. Y., and Chicago. — Wm. G. Snow has resigned from the Walker & Pratt Mfg. Co., to become a heating and ventilating engineer with the S. Homer Woodbridge Co., 4 Post Office Square, Boston. — Bertrand R. T. Collins saw much service in Cuban campaign. He writes: "May 24, 1898, received commission as ensign, U. S. Navy, after a competitive examination, and left Chicago for Key West, with 203 enlisted men for Sampson's fleet, off Santiago. June 2d, ordered for duty on board U. S. S. *Scorpion*, as watch-officer in command of the forward 6-pounder rapid-fire guns. June 7th, *Scorpion* left Key West to join Sampson's fleet off Santiago, taking the *Marblehead's* place on the blockade circle. June 9th, *Scorpion* opened fire on ship sup-

posed to be a Spanish gunboat; in collision same night with U. S. S. *Panther*, losing part of stern, and barely escaping sinking. June 10th, took part in the third bombardment of the fortification at the entrance of Santiago Harbor. June 18th, landed arms and food for Cubans at Segua, twenty miles west of Santiago. June 22d, took part in bombardment of Daiquiri, before the landing of General Shafter's army. June 23d, demolished two brick blockhouses and a railroad bridge, near Altares. June 30th, ordered to blockade off Cape Cruz and Manzanillo. July 1st, entered harbor at Manzanillo, retired under heavy fire from shore batteries, troops in trenches, and five Spanish gunboats, *Scorpion* being hit twelve times during the thirty-five minutes' engagement, our fire dismounting a gun on the guardship, killing three men and two women. July 3d, captured 100-ton steel lighter filled with stores for Spanish army, also small schooner with stores. July 14th, captured two more schooners off Guayabal. July 18th, took part in engagement at Manzanillo, which resulted in

burning, sinking, and complete destruction of five Spanish gun-boats, three transports, and the guard-ship, engagement lasting three hours. July 19th, demolished blockhouse and signal tower at Santa Cruz. August 11th, stopped, by firing solid shot, the German third-class cruiser *Geier*, off Guantanamo Bay. August 20th, entered Santiago Harbor, with Commodore Watson on board. September 21st, ordered home via Jamaica and Boston, arriving in Chicago, October 11th. October 22d, received my honorable discharge. On President McKinley's 'special escort' during Peace Jubilee, at Chicago."

1889.

J. W. CARTWRIGHT, JR., *Sec.*
Bangor, Me.

Frank H. Cilley is spending the winter as a volunteer in the Pencoyd Iron Works, proceeding as rapidly as possible from one department to another. He is having an interesting experience. — '89 will hold a class reunion early in March. Especial pains will be taken to make this, the tenth anniversary of graduation, a success. — It does not matter whether he knows where you

are or not, please put your name and address on a postal card and send it to the secretary. — A recent publication of considerable value to the worsted industry has been published by the Arlington Mills, Lawrence, Mass. This publication is the work of Franklin Warren Hobbs, and gives not only a very complete history of the worsted industry in the United States, but also many features investigated by the writer in foreign countries. It is to be noted that buying and selling of "Tops" at the present time is practically in line with the suggestions made by Mr. Hobbs, and is in itself a very great improvement in the business and indicates the appreciation with which this publication is held by those most interested. — W. H. Merrill, Jr., served as chairman at the meeting, January 9th, of the special committee appointed by the Underwriters' National Electric Association. This committee met in Chicago and conferred with all the prominent manufacturers of wire for electrical purposes in this country, and adjusted the requirements from an underwriter's point of view to meet such practical considera-

tions as were necessary. Edward V. French represented the interests of the Associated Factory Mutual Fire Insurance Companies on this committee. — L. Henry Kunhardt has been serving on the sub-committee of the city charter committee, appointed by the town of Melrose. The specific provisions of the charter have been accepted by the town and it is now before the Legislature. — John Hyde, of the Bath Iron Works, is busy with plans for new warships and repairs upon old government work, besides their steadily increasing business in the line of merchant vessels. The fine steel tramp steamer, recently turned out at Bath, is a notable addition to our merchant marine. — Arthur L. Davis is with Berlin Iron Bridge Co., at East Berlin, Conn. — Paul R. Hawkins served through the campaign in Cuba as adjutant of the Second Massachusetts Regiment.

1890.

GEORGE L. GILMORE, *Sec*
Lexington, Mass.

William Z. Ripley has lately been made corresponding member of the Société des sciences naturelles et mathématiques de

Cherbourg. — Calvin W. Rice, electrician of the Kings County Electric Light and Power Co., was recently elected treasurer of the Brooklyn Engineers' Club. — Samuel D. Flood received a commission in the regular navy during the late war and joined Schley's squadron at Guantanamo. He was in the midst of everything that happened along the south coast of Cuba. He was first assigned to the gunboat *Yankton* and later transferred to the *Marietta*. He was in action three times, twice with shore batteries and once with the Spanish gunboats. He was watch officer and during watch had command of the ship. Aside from Annapolis graduates there were only eight men who held a like position. Of these eight, two were Institute men, B. R. T. Collins, '88, of Chicago, being the other man from the Institute. Mr. Flood is now settled at Dallas, Tex. — B. H. Mann has been appointed inspector of the switching system at the new Union Station in Boston. During the construction Mr. Mann had charge of the work. — The engagement is announced of Gordon Taylor, to Miss Cook,

of Chicago. The wedding will probably occur in the spring. — The recent reunion of the class was held at the Technology Club, December 29th. Twenty-eight were present. Charles Hayden presided and a pleasant evening was spent. The average salary of those present was found to be \$2,720. It was voted that the next reunion be held at the Technology Club in 1900. James A. Carney, of Chicago, came the greatest distance to attend. — C. B. Beasom has been appointed an insurance inspector. — E. T. Newton is with the Wauregan Paper Company at Holyoke. — H. B. Burley is an inspector for the Factory Mutual Fire Insurance Co. — G. T. Voorhees has written a book called "Indicating Refrigerating Machines." It will be published in March. — S. W. Moore is in Colorado Springs, Colo., for his health. — Franklin Knight is an Episcopal minister at Colorado City, Colo. — Francis Goodhue, Jr., is in the wholesale lumber business in Philadelphia. — H. L. Noyes was married, December 28th, 1898, to Miss Anna H. Ransom, of Ulster, Pa. — Wallace

Macgregor is operating a mine at Johnsville, Plumas County, Colo.

1891.

HENRY A. FISKE, *Sec.*

93 Water Street, Boston.

During the past year index cards for use in a card catalogue have been sent to the members of the class association and replies have been received from eighty-nine. These cards give information which is especially interesting to class members, and some of it may be interesting to other Institute men. Of the eighty-nine from whom we have heard, thirty-six have joined the ranks of the married, eleven of these thirty-six have one child only and nine have two children. The class boy is apparently Woodman Clark Hamilton, son of Edgar Lockwood Hamilton, born January 26, 1895. It is always interesting to note the pursuits followed by men who forsake the profession for which they fitted at the Institute. Thus '91 has two ministers, one physician, one brewer, one fruit farmer, one hotel proprietor, one editor, one banker, one in the U. S. Army, and several in the insurance business and

other ordinary business pursuits. — W. H. Roots writes from Chelan, Wash., that he is a missionary in the far West, his territory comprising ten thousand square miles, and he is fifty miles one way and forty another from a railroad. — A card from C. P. Wetherbee gives an example of the varied experiences through which a Tech man may pass in a short time while following his profession: 1893-94, Paris, France, École du genie maritime; 1894, Engineer S. S. *Paris*; 1895, Newport News, Va., draughtsman for U. S. Navy; 1895-96, Baltimore, Md., Holland Submarine Boat; 1896, Glasgow, Scotland, with Prof. J. H. Biles; 1897, Havre, France, with Augustin Normand et Cie, torpedo boats; 1898, Bath, Me., the Bath Iron Works. — Thomas V. Bolan is district engineer, General Electric Co., at 509 Arch Street, Philadelphia, Pa.

1892.

PROF. SEVERANCE BURRAGE, *Sec.*
Purdue University, Lafayette, Ind.

Frederick L. Francis, of Fitchburg, Mass., was married, September 27th, to Miss Lula M. Horton, of Brattleboro, Vt.

Mr. Francis is a frequent visitor at the Technology Club, of which he is a member. Since leaving Tech he has been associated with his father, H. M. Francis, of Fitchburg, in the practice of architecture. — Henry J. Schlacks is an architect in Chicago, and has built many fine churches in that vicinity. — George V. Wendell has received his doctorate at Leipsic, *summa cum laude*. — George H. Goodell is mechanical engineer of the Northern Pacific Railway Company at St. Paul. — Albert S. Heywood is engineer in the Atlanta office of the General Electric Company. — George F. Rowell has a position on the editorial staff of the *Engineering Record*. — Joseph P. Lyon is supervisor of bridges, Western Division, New York Central and Hudson River R. R., N. Y. Central Station, Rochester, N. Y.

1893.

FREDERICK H. FAY, *Sec.*
60 City Hall, Boston.

In *L'éclairage électrique* for December 10, 1898, there is a three-page illustrated article on the "Effect of Temperature on Insulating Materials," by P.

Letheule. It is an abstract of a long paper by William Esty, which appeared in the last number of the *Technograph*, the annual publication of the Association of Engineering Societies of the University of Illinois. The research on which the article is based was carried on by two senior electrical students under the direction of Mr. Esty, who is now professor in charge of the department of electrical engineering at the University of Illinois.—S. Edgar Whitaker is building an electric railway in southeastern Massachusetts.—Orton Wheelock Albee, of Newark, N. J., was married, January 7th, to Miss Ella Margerum Littel, also of Newark. The ceremony was performed at the Church of the Transfiguration, in New York City. For four years following his graduation from the Institute, Mr. Albee was assistant to Inspector of Ordnance, U. S. Army, with headquarters at Philadelphia. In 1897 he accepted the position of superintendent of the ordnance department of Benjamin Atha & Illingworth, of Newark, with whom he is at present engaged. Although not regularly enlisted

in the army, Mr. Albee probably contributed as valuable service to the country during the late war as any member of the class. Upon assuming the duties of his present position he made extensive alterations and improvements in his plant, so that when the war came his firm was able to take important government contracts for guns, many of which were used as armament for the auxiliary navy.—Albert Farwell Bemis is a member of the committee on the Walker Memorial Gymnasium Fund recently appointed by the Alumni Association.—Our old athletic friend, Edmund L. Andrews, has gained a novel distinction among Institute men in connection with the telephonic dinner of the Northwestern Association of the Massachusetts Institute of Technology, held in Chicago, February 3d, at which Technology alumni in Boston, New York, St. Louis, Chicago, and other cities were connected by telephone. To Mr. Andrews, who is division superintendent of the American Bell Telephone and Telegraph Company at Chicago, is due the credit of arranging the telephonic feature of the dinner. At the elec-

tion of officers held that evening, Mr. Andrews was elected vice-president, and Edward McKim Hagar was also re-elected secretary of the Northwestern Association. — George Edward McQuesten, who returned not long ago from a trip around the world, recently gave an interesting smoke talk at the Technology Club upon "Japan." — Benjamin Merwin Mitchell, lately at Passaic, N. J., with the Manhattan Rubber Manufacturing Company and the New York Lubricating Oil Company, was, at last accounts, in Johannesburg, South Africa. — James Albert Emery, of Emery & Crump, street railway engineers, is in New Orleans, La., fulfilling a professional engagement. — Harley W. Morrill, until recently clerk to roadmaster of the New York, New Haven and Hartford Railroad at South Framingham, Mass., has been appointed roadmaster on the Union Pacific Railroad. — Herbert W. Stanwood died at the Boston City Hospital, March 9, 1899, after a very brief illness. — C. H. Deitering and E. C. Klipstein are associated under the firm name of Deitering & Klipstein, Archi-

itects, at 708 Pine Street, DeSoto Building, St. Louis, Mo.

1894.

WALTER E. PIPER, *Sec.*

Fells, Mass.

Rigby Wason is making a tour around the world, — Colombo, Sidney, New Zealand, Hongkong, Shanghai, Yokohama, Vancouver, — and Boston toward the end of June. — Clarence D. Pollock is assistant engineer in the Department of Highways, Borough of Brooklyn, N. Y. — S. H. Brockunier has been most fortunate, as shown by a clipping from the *Manitoba Free Press*, of Winnipeg. Last May he located a gold-quartz mining property on Elizabeth Lake, and in October was able to bring out specimens of ore to be assayed, which showed the wonderful richness of \$20,000 a ton, almost pure gold. The workings so far on the mine, named the "Virginia," consist of a tunnel forty feet long, which taps the vein fifty feet below the surface. A shaft was then sunk in the head of the tunnel, which is now down about thirty-five feet. The one great drawback is the way of getting to the property, which is

seventy miles from Rat Portage, in an entirely new district; but the unlimited capital behind the company which Mr. Brockunier has formed will soon overcome that. A complete set of hoisting and pumping machinery is now on its way out. — Arthur L. Patrick is no longer with the Keating Wheel Co. He is at the home office of the American Saddle Co., Cleveland, Ohio. — Leslie R. Moore, who is studying for Ph. D., at Heidelberg, has been heard from recently. He expects to complete his *Arbeit* this spring, when he will return to Boston. — The annual dinner was held Saturday evening, February 25th, at the Exchange Club. In the absence of President Price, Vice-President MacClure presided, to the great satisfaction and pleasure of all. After the dinner, during which we enjoyed various selections by Astrella Brothers' trio (harp, violin, and flute), the business of the evening was taken up. The secretary read a letter from R. B. Price resigning the presidency of the class. This letter expressed such a deep interest in the class and friendship for its members, that all felt doubly sorry that Price could

no longer meet with us. The following officers were elected: President, C. A. MacClure; Vice-President, A. B. Tenney; Members of Executive Committee, G. W. Sherman and C. N. Wrightington. The dues were fixed at one dollar for the ensuing year. The meeting endorsed the proposal of the Executive Committee to have informal dinners monthly during the winter. A table will be reserved at some hotel or restaurant. Members of the class in Boston and vicinity will be notified by postal. In this way it is hoped old friendships will be renewed, and new friendships made among members of the class. The speaking after the meeting was entirely informal. It was a kind of experience meeting. Harry Bates sang twice; this added much to the evening's enjoyment. Those present were: Lane, Loring, Tenney, Phelan, Claflin, Bean, Batson, Sherman, Wrightington, MacClure, King, Thorndike, Hopewell, Bates, Zapf, '95, Ripley, Robbins, Reed, Prescott, Sayward, Gardner, and Piper. — Charles F. Hopewell, inspector of wires in Cambridge, Mass., has compiled very valuable taxation statistics

on the use of streets by corporations in the municipalities throughout the country.—Kenneth F. Wood writes: "I was a sergeant of the Hospital Corps of the Brigade of Rhode Island militia when the war broke out. Our organization was given no opportunity to volunteer, as there seems to have been no central government Hospital Corps in existence. We were, however, kept under orders throughout the war and did a great many days' duty at Camp Dyer and at Montauk Point."—Henry A. Swanton is draughtsman, Marine Department, Maryland Steel Co., at 312 East North Avenue, Baltimore, Md.

1895.

EDWARD H. HUXLEY, *Sec.*

29 Hampshire Street, Cambridgeport,
Mass.

Walter W. Reed has charge of the electrical construction in the installation of a three phase plant in Houston, Texas.—Richard G. B. Sheridan is in Russia for the Brown Hoisting and Conveying Machine Co.—G. W. Hayden has been in Philadelphia since graduation; he is now in Boston with the N. E. T. & T. Company.—A. D.

Fuller was married in November to Miss Clapp, of Wakefield.—Azal Ames, Jr., has returned from Porto Rico, where he has been with the First U. S. V. Engineers. Mr. Ames was quite ill as a result of the campaign, but is now recovered and is about to enter civil life again.—P. H. Blodgett writes interestingly from McKeesport, Pa., where he is employed by the National Tube Works Co.—The number of replies to the letter sent out in November by the secretary was discouragingly small, and the money received to publish a class book was hardly enough to make a beginning.—C. H. Clark was married in November to Miss Carver, of of Roxbury.—E. E. Denison has accepted a responsible position with the International Paper Co., in New York.—R. D. Farquhar has returned to Paris to continue his work in architecture.—W. T. Hall is back at the Institute as an instructor in chemistry.—F. T. Miller is spending part of his time in Boston and part in New York. He is secretary of the F. M. Dodge Co., construction reports.—C. A. Meserve has returned from Munich, where

he has been studying. — George F. C. Merriss died in Washington, D. C., March 4th. He had been afflicted with a pulmonary trouble for the past two years. A number of members of the Washington Association of the Massachusetts Institute of Technology attended the funeral services held in that city. — The engagement is announced of Ernest J. Loring and Miss Elsie S. Lake, of Somerville.

1896.

FRANK E. GUPTILL, *Sec.*

71 Newbury Street, Boston.

Benjamin Hurd, after two years with the Lorain Steel Company, is now associated with Blood & Hale, of Boston. — John E. Lonngren is with the Illinois Steel Company at Joliet, Ill. When the war broke out he enlisted with Company B., Third Illinois Volunteer Infantry, and was offered a commission as 1st lieutenant, but illness and the short duration of the war prevented active service. — E. A. Baldwin, has just announced his engagement to Miss Amy Higgins, of Dorchester. — Frank A. Thanisch left Boston January 31st, to represent W. R. Grace & Co., of New York, as

mining engineer in Peru, Bolivia, and Chile, South America. — The annual business meeting and dinner of the Class of '96 was held at Young's Hotel on the evening of February 17th, with an attendance of thirty members. That part of the constitution relating to the election of class officers was revised so that the officers to be elected for this year were a Secretary and an Assistant Secretary. F. E. Guptill was reelected Secretary and C. G. Hyde was elected Assistant Secretary. — E. B. Cunningham is engaged in the manufacture of sugar in Sugar Land, Texas. — F. M. Conant is chemist with the Mathieson Alkali Works Co., at Niagara Falls, N. Y. — Andrew W. Crawford is an attorney-at-law, with an office at 701 Stephen Girard Bldg., Philadelphia. — Bradley Stoughton and Miss Van Everen were married January 3, 1899. — Harry J. Brown writes concerning his service in the war: "I had the honor to command the squad assigned to the work of preparing the firing apparatus, adjusting the electrical mechanism of the mines, wiring the firing cases, and testing the cables

and mines during mining operations. On April 6th I started with eighteen expert electricians from the Lynn works of the General Electric Co. and a number of laborers, preparing the apparatus at Fort Independence, Castle Island, Boston Harbor. The crisis with Spain approached so fast that on April 20th we began wiring the casemate at Fort Warren, the work being still continued under my charge at Fort Independence. On June 1st, I severed my connection with the Volunteer Corps, and was appointed chief electrician in charge of the mining and signal work, which position I held until October 1st, when I left government employ and returned to the General Electric Co." — George Sidney Bowes is connected with the Wellman, Seaver Engineering Co., of Cleveland, Ohio. He married, October 4, 1898, Miss Lillis Barlow, of Boston. — Harry P. Browne is assistant draughtsman, Construction and Repair Department, at Navy Yard, Washington, D. C. — Walter M. Hollis is with the General Electric Co., Schenectady, N. Y. — Harry A. Pressey is now assistant professor of civil engineer-

ing at Columbian University, Washington, D. C. — James W. Reynolds is with the Baum Iron Co., Omaha, Neb. — William G. Wall is manager Electrical Department, Smith-Courtney Co., at 1418 East Cary Street, Richmond, Va. — An interesting letter has been received from Leslie Dana. He says, in part: "On April 23d, Battery A, First Missouri Volunteers, of which I was and am still a member, went into camp on a vacant lot in St. Louis. Four days later, we were sent to the State camp at Jefferson Barracks, where we recruited for about two weeks. Our next camp was at Chickamauga Park, which we reached after a tough journey of four days, being part of the time without drinking water and with no attempt to keep clean. We were at this camp until July 26th. During this time I was chief trumpeter for the First Corps, our battery being the headquarters of General Williston. On the 26th the battery marched to Ringold, about twelve miles from our camp, to take train for Newport News. I was not much interested in the march, being confined to quarters and riding

on the ambulance, as I was ill with pleurisy and bronchitis. In fact it was only by the open corruption of our surgeon that I was allowed to go at all. At Newport News we nearly missed out, after all, for there was not room enough for the four batteries and the signal corps, but our 'pull' was in working order, and we went. Ten days later we ran aground at Guanico, P. R., and stayed there until the tide took us off, our kind foes, in the meantime, refraining from any demonstration. After a night in Guanico Bay we were ordered to Ponce and from there to Arryo to unload. At this point I was one of four men selected to work on the steam launches of the *Gloucester* while unloading. My experience under Wainwright was most pleasant, for I found his men to be as hospitable as they were brave. We unloaded in about a week and were ordered to take the town of Suyamo, about ten miles distant, after which we were to sweep up things generally at San Juan. The blockhouse at Suyamo is back of the town among the hills, and after a few hours' delay we unlimbered be-

fore it. As the leading battery was about to fire we were ordered to return as the Protocol had been signed."

1897.

JOHN A. COLLINS, JR., *Sec.*

55 Jackson Street, Lawrence, Mass.

Charles R. Currier is with the Reese Manufacturing Co. of Virginia.—The second annual dinner was held on December 10th, at the Technology Club. Twenty-eight members were present. The dinner was served in the "Common Room;" the tables were very prettily decorated. A. W. Jackson acted as toastmaster, and toasts were responded to by Messrs. Humphreys, Dougherty, Hunt, Atwood, Hopkins, and Bradlee. Baker sang several songs. P. L. Dougherty, in his speech, paid a brief but glowing tribute to the work and memory of William Barton Rogers. Interesting letters were read from several of the absent members of the class. Walter Humphreys in response to a toast, "The Club," made mention of the fact that '97 had not as yet given anything to the Technology Club as a memorial of the class. Many of the classes, in-

cluding '98, have done so, and the speaker thought the idea a good one. A committee is to be appointed to confer with the House Committee of the Club in regard to the nature of the gift. The matter will be laid before the class members in the next letter, to be acted upon. — The engagement is announced of H. F. Hoit and Miss Florence Stinchfield, of Auburn, Maine. Miss Stinchfield is at present studying in Florence, Italy. — We quote the following from *The Tech*: E. S. Dodge has been admitted to the Beaux Arts, in Paris, to study architecture. This honor is given only after a most searching examination to the first fifty out of a list of from four to five hundred applicants, including representatives of all nations of the world. — Bernard Barrows is an assistant examiner in the United States Patent Office at Washington. — A. S. DeWolf is with the American School of Correspondence. — E. P. Mason is with the Draper Co., Hopedale, assisting in perfecting the Northrop Loom. This loom is in some ways revolutionizing the cotton manufacturing industry. — Harry D. Hunt, Class Orator, is the

proprietor of *The Evening Chronicle*, a daily newspaper published in North Attleboro, Mass. — H. T. Mulhall is a grain broker at the Boston Chamber of Commerce. — Malcolm F. Ewen sailed for London late in January. He is connected with the American Luxfer Prism Co. — Arthur D. Spiess is treasurer of the Trading and Exploring Co., of Dawson City. He is at present in London. The Company has been very successful during the past season. — F. C. Gilbert has decided not to follow chemistry, but is treasurer's assistant with the Library Bureau, on Atlantic Avenue. — Edward R. Motch is with the Cleveland branch Marshall & Huschart Machinery Co. — Edwin P. Osgood is chief clerk, office of Purchasing Commissary (Huntsville, Ala.), care Lieut.-Col. H. B. Osgood, office of Commissary-General, Washington, D. C. — Jere R. Daniell writes concerning his military experience: "As for duties, well, to say the truth, there were more of us than the authorities knew what to do with. Of course we all familiarized ourselves as far as possible with the machinery of the monitors, but it took at most a week

or two to learn by heart every pipe and connection aboard those old relics of the civil war, and the more we familiarized, the less we liked the idea of active service aboard them. It was very much like learning our engineering backward. In some of the old craft the government was foolish enough to place new boilers of the water tube type, and, as a result, their power plant was somewhat of an anomaly: boilers furnishing steam at one hundred pounds reduced by means of a reducing valve to twenty pounds at the engines. Among the important duties to which we were assigned at times was the serving in various boards appointed by the commandant of the yard for the survey and appraisal of government property. Such, for instance, as to determine whether certain copper cooking boilers at the marine barracks were fit for further service, and, if not, what disposition should be made of them." — Warren D. Brown served as corporal in Co. A., First Regiment, United States Volunteer Engineers. The regiment was mustered out in January.

1898.

C.-E. A. WINSLOW, *Sec.*

Hotel Oxford, Boston.

Dickson Brown is in the mechanical department of the Tidewater Oil Company at Bayonne. — Paul B. Wesson is draughtsman and mill engineer with the Lowell machine shops. — D. C. Fenner is with the Bethlehem Iron Company. — Robert E. Kendall is chemist for the bureau of tests, International Paper Company. — Joseph H. Sears is in charge of the oil laboratory of the American Cotton Seed Oil Company. — The secretary desires information as to the whereabouts of the following men, and requests any one knowing their present addresses to communicate with him: L. M. de Azevedo, A. A. Barrett, H. H. Clark, W. A. Cleaveland, H. B. Collins, E. T. Cudworth, E. Emery, R. M. Hughes, W. B. Lovejoy, H. Nesbit, F. C. Plumer, R. C. Prosser, A. Sargent, G. Waldo. — One hundred and thirteen graduates and seventy-six non-graduates have replied to the circular letter sent out last fall with the secretary's record blanks. A second notice has recently been sent to the

remaining eighty-six graduates and one hundred and thirty non-graduates. — The first Tuesday in every month is regularly observed by the gathering of a dozen or fifteen '98 men at the Technology Club, to recall pleasant memories and to compare notes as to the present. April 4th, May 2d, June 6th, are the nights. — W. R. Strickland, Ensign, U. S. N., has been mustered out and is now with the Buckeye Engine Co., Salem, O. — H. J. Benson is with the Sacramento Valley Railroad and has recently been surveying at Chloride, Ariz. — R. S. Farwell, who was married, in October, 1896, to Miss Lillian M. Barnes, is assistant secretary of the Oak Woods Cemetery Association in Chicago. — C. E. Fleming is treasurer and manager of the Citizens' Telephone Company, Spartanburg, S. C. — G. McM. Godley is studying at the Bergakademie, Freiberg. — C. S. Hürter has returned from Costa Rica, where he has been in the employ of a mining company. — G. B. Pillsbury is a cadet at West Point. — E. C. Sherman is now in the office of the city engineer, Boston, the work of the U. S. Board of Engineers

on Deep Waterways, on which he was engaged, having been completed. — C. A. Stickney, who was married last April to Miss Edith Pierpont Jones, is at St. Paul, as assistant to the general superintendent of the Chicago and Great Western Railway. — W. C. Watrous is engaged in placer and quartz mining at Dawson City. — The first graduate dinner of the class was held at the Hotel Vendome, Boston, on Saturday, December 10th. At a short business meeting before the dinner the minutes of the last undergraduate meeting were read and accepted and the class finances reported on, showing a balance of some thirty dollars, in spite of the fact that many class assessments remained unpaid. The class unanimously voted to recognize the Association of Class Secretaries. The thirty-one members present then adjourned to the supper-room, where W. E. Putnam, Jr., presided as toastmaster. After the dinner, C. E. A. Winslow read the replies of the class to the secretary's circular letter, and E. N. Curtis spoke on "Our Late War with Spain," treating the subject like a skilled politician. E. F. Russ

made a capital speech on "Business," and C. S. Koch pictured the forlorn character of "'Tech' without us." F. M. Kendall closed the formal speaking by an account of his summer experiences with the Sixth Massachusetts Volunteers. Singing by E. C. Little, G. R. Anthony, F. E. Coombs, and A. H. Tucker enlivened the proceedings. A very pleasant evening closed with the reading of letters from G. R. Wadsworth, L. D. Gardner, D. Mayer, R. S. Allyn, W. R. Strickland, R. W. Babson, and others, a telegram from G. F. Ulmer, and a spirited poem from T. E. Tallmadge. — Van Rensselaer Lansingh is with the assembling and testing department, Western Electric Co., 109 Kimbark Ave., Chicago, Ill. — Edward S. Chapin is with American Glue Co., 415-431 Atlantic Ave., Boston. — Irvin H. Kaufman is draughtsman, The Geo. F. Blake Manufacturing Co., Third Street, East Cambridge, Mass. — Durand Mayer is in the designing de-

partment, Chicago Mining Machine Co., Harvey, Ill. — Willard B. Nelson is teacher of physics, chemistry, and mathematics, Rutgers College preparatory school, New Brunswick, N. J. — Henry D. Osgood is civil engineer, Hancock, Mass. — Benton B. Priest is with Boston Elevated Ry. Co., 101 Milk Street, Boston. — Joseph H. Sears is assistant chemist, American Cotton Oil Co., at the N. K. Fairbanks Company's Works, 228 East 19th Street, Chicago, Ill. — Ralph E. Wilder is inspector of bridges, New York Central & Hudson River R. R., Mott Haven Station, 138th Street, New York, N. Y. — Theodore Brooks Smith, a member of '98, in the electrical engineering course, for three years, died on July 10, 1898, aged twenty-two years and six months. He was a high principled man, a promising engineer and a cheery companion. He is deeply mourned by his family, his friends, and his classmates.

1870

WALDO OGDEN ROSS died December 27, 1898, of pneumonia, after a very brief illness.

Mr. Ross was born in Boston, in July, 1850. His father, the late M. D. Ross, was one of the earliest and staunchest friends of the Institute, and placed his son, at the age of fifteen, in the first class that was organized in the School of Industrial Science, with which he remained in connection for two years. At the end of this time he went into business. A few years later, upon the opening of the Physical Laboratory, he returned, and for two years devoted himself to the study of Physics, under Professor Pickering, with whom he went to Spain as assistant, to observe the total solar eclipse of 1870. At the close of this period of special study he again took up a business life, and continued therein until his death. In 1884 he married Miss Ellen Haven, of Boston, who with one son survives him.

Mr. Ross retained his interest in, and his affection for, the Institute to the end of his life, and it owes much to his thoughtful and discriminating generosity. The Ross collection of optical apparatus, of which the Institute has had the use since its purchase in 1873, was an addition to the slender resources of the Physical Department which was invaluable at the time, and which is still in constant service. And from time to time gifts of books and pamphlets have shown evidence of his continued regard. The Technology Club also owes to him many of the photographs which adorn its walls, and more than one hundred of the volumes in its library.

Both as a young man and in maturer years Mr. Ross was gentle and retiring, and of quiet tastes. He loved his books and pictures, and found his chief pleasure in his relations with his family and intimate friends. He shrank from publicity, but could always be relied upon to do his part in any good work. By his death the Institute loses another of its most constant friends. C. R. C.

1872

WILLIAM BROWN DODGE. — For more than twenty-five years the Class of '72 was fortunate in having the ranks of its graduates unbroken. It lacked a few months only of thirty years from the time when the class came together at the Institute, that the first death occurred. William Brown Dodge died January 29, 1898, at Columbus, Ohio, of sciatica, after a brief illness. He was born June 5, 1851, in Beverly, Mass., which was his home during the four years which he spent at the Institute. Shortly after graduation he entered upon railroad work with what is now the Pittsburg, Cincinnati, Chicago and St. Louis Railway, a line covering five States, and more than fifteen hundred miles of railroad. A few years later he was appointed scale inspector of the entire line, a position requiring adequate mechanical and engineering training, ability to plan and direct work, and, in addition, absolute trustworthiness in a position not under the direct supervision of any other official. Dodge possessed all these necessary qualifications. No one who knew him well could question his downright honesty and reliability. Personally he was of a quiet but very genial disposition, and his happiness was of the sunshiny sort which made itself evident to all who came in contact with him. The only Institute man where there were graduates of many other colleges, he was always loyal to his Alma Mater. He was married June 28, 1887, at Steubenville, Ohio, to Hannah Spaulding, who survives him, and his married life was spent in Columbus, Ohio, where he made many friends. He left no children. It is the tribute of one of his business friends that he held the esteem of his superiors and the thorough respect of his subordinates, and that in his death the railroad company lost a faithful employee, and his associates a good comrade.

C. F. A.

NECROLOGY

1870. Waldo Ogden Ross, b. July 11, 1850, at Boston, Mass.; d. at Boston, Mass., December 27, 1898.
1893. Herbert Winthrop Stanwood, b. May 7, 1872; d. at Boston, Mass., March 9, 1899.
1895. George Frederic Carpenter Merriss, b. December 5, 1871; d. at Washington, D. C., March 4, 1899.
1898. Theodore Brooks Smith, b. January 29, 1876; d. July 10, 1898.
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REVIEWS

The Technology Quarterly for March will contain: "The Proceedings of the Society of Arts;" "Repeated Stresses," by Jerome Sondericker; "Discussion of Professor Sondericker's Paper on 'Repeated Stresses,'" by James E. Howard; "The Planning and Building of the Southern Station, Boston," by George B. Francis; "The Mechanical Equipment of the Southern Station," by Henry J. Conant, '87; "The Economic Relation of the Proposed Deep Water-ways to the State of New York," by George W. Rafter; "Notes on the Hydrolysis of Starch by Acids," by G. W. Rolfe and W. H. Barlow, '98, and "Reviews of American Chemical Research."

OUTLINES OF INDUSTRIAL CHEMISTRY

A Text-Book for Students, by Frank Hall Thorp, Ph.D., Instructor in Industrial Chemistry, Massachusetts Institute of Technology. Published by the Macmillan Company. 8vo. Cloth. pp. xx., 541.

The industrial supremacy of a country depends far more than most of its citizens are usually aware upon the degree of chemical knowledge in the community and the skill with which that knowledge is applied. If it be true that the battle of Waterloo was won

on the football fields of England, it is certainly no less true that many of the great victories of peace are to be won in the classrooms and laboratories of the technical schools. Those manufactures which rest upon chemistry, and few do not, are advancing with extreme rapidity in the United States. One company, for example, is even now turning out more than seven hundred tons of alkali a day, and the region immediately around Niagara is perhaps already as interesting to the industrial chemist as any in the world. Those who have studied the matter carefully express their belief that within twenty-five years the preëminent position now occupied by Germany with respect to these branches of industry will have been carried and held by the United States. In view of all this, and especially when one considers the recent development of chemical literature in this country, it is somewhat surprising that so few really good text-books devoted to industrial chemistry should exist in English. The "new" translation of Wagner's Chemical Technology is already old, while the later and thoroughly excellent hand-book, by Sadtler, concerns itself only with Industrial Organic Chemistry. The student of the applied science has, therefore, been forced, for the most part, to consult the numerous hand-books and publications dealing with particular phases of the general subject. There existed a real need for such a thorough and comprehensive work as the present text-book by Doctor Thorp, through which the student might gain a general view over the entire field of industrial chemistry, and in which those principles and methods of the first importance should stand out clearly, with their outlines not confused by minor processes and details.

The work is divided into two parts; 256 pages being devoted to Part I., which deals with Inorganic Industries, while the Organic Industries are considered in Part II., which contains 272 pages. A complete and well-constructed index concludes the book. The author first discusses briefly but clearly the general operations which commonly enter into the processes of manufacturing chemistry, as the various methods of evaporation, filtration, etc., and the more typical forms of general apparatus are described and illustrated. The several classes of solid, liquid, and gaseous fuels are

next taken up, together with different forms of coke ovens, producers, and regenerative furnaces. The subject of water is then briefly treated from the standpoint of the manufacturer, after which comes an orderly and excellent review of all the more noteworthy inorganic processes and products. Out of the multitude of details and the great number of processes of more or less consequence in the art the author has selected with much discrimination and a good sense of proportion only those which have special claims to recognition either by reason of their typical character or great industrial importance. About 100 pages are given to the soda and potash industries, chlorine products, the heavy acids and ammonia, including a brief discussion of the several types of electrolytic processes for chlorine and alkali, hypochlorites and chlorates. Here the difficulty of obtaining late information has led to one or two statements which are not in accord with present facts,—for example, the diaphragms now used by Le Sueur last for weeks, and in some of their forms for months, instead of from twenty-four to forty-eight hours, as stated on page 105, and, similarly, the anodes not infrequently show a life of six months or more instead of as many weeks.

Following the heavy chemicals the subject of fertilizers is taken up and receives an unusually compact and succinct treatment. It should be noted, however, that the term *tankage* has a wider meaning than that given to it on page 139, being applied generally to the dried residues from rendering processes.

The subjects next in order are lime, cement and plaster of Paris, glass, the ceramic industries and pigments, under which last title ing the source and preparation of all the well-known pigments is treated of under their appropriate headings. The remainder of Part I. is devoted mainly to the cyanides, sulphates, and oxygen, although such other subjects as iodine and phosphorous obtain due consideration.

The several subject matters of Part II. are arranged in an orderly sequence, beginning with the destructive distillation of wood and the various products which result therefrom, and passing to the distillation of bones and the preparation of illuminating gas. This

leads logically to coal tar and the cruder products of its treatment, and then to mineral oils and the methods and products of their refining. Vegetable and animal oils and waxes are next discussed, after which the student is called upon to consider the manufacture of soap and candles, the sources and properties of essential oils and of the principal resins and gums, with their correlated products, as varnishes and rubber. It is but a step to the preparation of starch and the dextrine and glucose industries, and from them through cane sugar to those industries which are based on fermentation. A chapter on explosives, one of about seventy pages on the textile industries, a short account of the processes of paper-making and of those involved in the manufacture of leather, together with a section on glue, complete the book. The arrangement of this second part throughout, no less than the logical way in which each subject is developed, deserves high praise, and cannot fail to be of great assistance to the student toward securing a compendious knowledge of these leading manufactures and a clear idea of their relations to each other. In a word, no feature of the book more impresses the reader than the clear and logical style of treatment by which a multitude of facts are shown to have such interrelations as fix them the more easily in the student's mind. Many of the longer sections have been reviewed in manuscript by experts in their departments, and a particularly valuable feature of the work is to be found in the references to the literature of the subject which follow each division of the book.

Ninety-five illustrations accompany the text, and for the most part serve their purpose fairly well. They are generally merely diagrams illustrating the principle and arrangement of apparatus, and are often too small to be easily read. The text, however, is itself so clear and well arranged that the student will find no difficulty in following the author's meaning, and the book as a whole should prove most helpful. It is dedicated to the memory of the late Professor Norton, and is a deserving tribute to the noble man who did so much to build up the department of Industrial Chemistry at the Massachusetts Institute of Technology.

A. D. LITTLE, '85.

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